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Authentic Teaching and Learning in Malaysian National Dual Training System (NDTS) Apprenticeship Program

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Abstract: Authentic teaching and learning is a strategy that draws upon the apprentices' talents and experience within real-world settings, which provides them opportunities to exhibit and utilize their fundamental knowledge and skills. To optimize this strategy, skills trainers need to ingrain the apprentices with confidence and polished skills by synthesizing their personal qualities, in addition to their professional practices. This study expected to assess the acknowledgment of authentic teaching and learning of National Dual Training System (NDTS) program. A quantitative research design was used to conduct this research, involving 327 skills trainers in 3 different regions - Central, Northern and Southern. Statistical analysis was performed with the IBM Statistics version 22 software. Data were expressed as means and standard deviation. The Assessment Tool of Authentic Teaching and Learning introduced by Herrington & Oliver, 2000 was utilized as the instrument. The findings illustrate that a majority of the skills trainers provided feedbacks towards the acknowledgment of authentic teaching and learning at a moderate level. Nine authentic learning components were discussed: Provide authentic context that mirrors the way the information will be utilized as a part of real-life; Provide authentic exercises; Provide access to industrial experts, and the displaying of procedures; Provide numerous roles and points of view; Support shared development of learning; Promote reflection; Promote articulation; Provide coaching and scaffolding and; and Provide authentic assessment of learning inside the undertakings. Thus, this study inferred that integrating authentic teaching and learning of National Dual Training System (NDTS) program provides a further enhancement apprentice learning outcome.

Keywords: Apprenticeship programmes, assessment tool of authentic teaching and learning, authentic teaching and learning, National Dual Training System (NDTS), skills trainer.

1.   Introduction

Authentic teaching and learning (T&L) is an approach meant to enhance the apprentices' motivation towards learning by creating T&L activities that are similar to actual workplace situations (Bennet, et al., 2005; Borthwick, et al., 2007; Wagner, 2008). Apart from that, authentic T&L also takes into consideration the trainees' perspective by adapting the syllabus by assigning them tasks that are related to real workplace situations (Andersson & Andersson, 2005). A conducive learning environment provides better opportunities for apprentices to combine concepts and theories from the classroom and apply them to real-life practices (Bennet et al. 2005; Borthwick et al. 2007). The apprentices not

only have access to knowledge, but they could also relate them to the actual context through values that have been inculcated, which indirectly provide them with invaluable experience (Cranton & Carusetta, 2004).

The participation of apprentices in authentic T&L is more meaningful as the main source of knowledge compared to the theories that they learn in the classroom (Billet 1996). This view is reiterated by constructivism philosophers who feel that apprentices could build their knowledge based on their experience. This point is also supported by Reeves et al. (2002) that state that knowledge which is learned theoretically is not adequate in authentic T&L. Instead, authentic T&L activities could define any theory better, as they can be adapted with real-life experiences (Brown et al. 1989). Thus, in authentic T&L, apprentices should be allowed to access the actual framework utilized by practitioners and experts in the field of study (Brown et al., 1989). Meanwhile, Lave & Wenger (1991) state that apprentices must master the basic elements in their specific field. Through authentic T&L experience, apprentices are more inclined to think that every problem can be solved and that there could even be various solutions. The more exposure given to apprentices, the faster will the apprentices build up their knowledge and skills, similar to the experiences of professionals (Lombardi 2007).

The Situated Learning Theory was applied as the main foundation in the authentic T&L that was the focus of the study (Collins 1998; Brown et al., 1989; Lave and Wenger 1991, McLellan 1995). The *Situated Learning* theory was first introduced in the 1980s, when a lot of research on authentic T&L were carried out (Rule 2006). From past research, it could be concluded that two major problems that are still relevant to be studied are the gap between the educational theories and teaching practical (Herrington, Reeves & Oliver 2006); and between learning experiences at training institutions and real experiences in the industry (Stein, Isaacs & Andrews 2004). Even though numerous researches on authentic T&L have been conducted, but there are still several problems on these two issues that can be studied. This study fills in the wide gap related to authentic teaching and learning (T&L) in the Malaysian context. Specifically, the objective of this study is to identify the frequency of implementation of authentic T&L among skills trainers for the dual system apprenticeship program.

2.   Methodology

The research involved 327 respondents who were skills trainers of the dual system apprenticeship program under the Malaysian Skills Certification System, Department of Skills Development (JPK). A pilot study was conducted randomly on 120 skills trainers in the manufacturing sector from the East, Sabah and Sarawak regions. The respondents for the pilot study were chosen based on similar characteristics for the actual study. The sets of questionnaires were distributed to the skills trainers during a slot of an SLDN course, which was assisted by SLDN facilitators. In survey research, a very large sample might not determine accuracy. A view that was used as guidance for this study was the statement by Balvanes and Caputi (2001) that proposed a minimum of 30 to a maximum of 500 samples would be adequate and suitable for research using statistical analysis. All skills trainers in the actual research were not involved as respondents in the pilot study. The skills trainers selected for the actual research had more than five years of experience in the manufacturing sector. The selection of experienced respondents was important to ensure that the findings of the study reflected the actual need of why the study was conducted. High-reliability value with an Alpha Cronbach .958 value proved that the questionnaire was capable of measuring what it meant to measure. The basis for a questionnaire's reliability was based on Kerlinger (1979) and Hair et. al (1998) who stated that the minimum Alpha Cronbach value accepted for survey research was to be of similar or more than 0.60 (>=0.60) value.
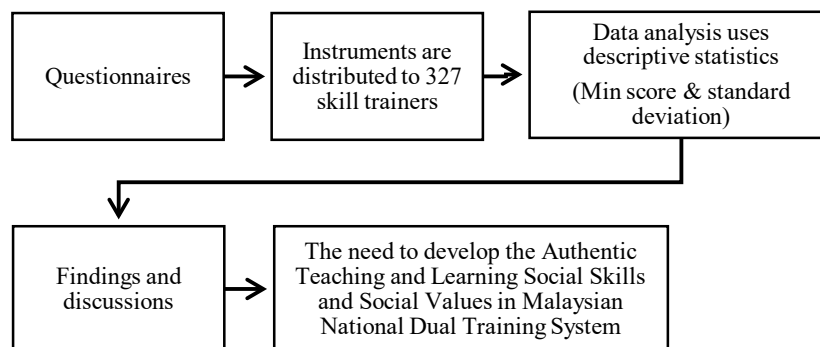

Fig. 1 - Flowchart of Survey Research Method

The descriptive statistical analysis used to report the findings were percentage, mean and standard deviation. The mean score was described using the descriptive statistic findings interpretation as proposed by Nunally (1976) and utilized by Norasmah (2001) and Azhar (2006). Nine authentic T&L social skills and social values elements were measured, where all items were adapted from a research by Herrington and Oliver (2000). The questionnaire used as the research instrument consisted of 44 items. For data analysis, the data was analyzed using descriptive statistics of the

IBM SPSS Statistics version 22 software to get the mean score and standard deviation values. The analyzed data results illustrate the frequency of authentic T&L of social skills and social value implementation among the trainers of the dual system apprenticeship program. Figure 1 shows the flowchart of the research methodology used in this research.

3.   Result

The analysis of part showed the overall picture of the respondents' background. The four main items in part A are:

    i.   Gender
   ii.   teaching experience
  iii.   highest academic qualification
  iv.   highest skill level

Table 1 shows the spread of the data distribution for the respondents' demographic data. The findings reveal that more than half of the respondents are male skills trainers, and followed by female skills trainers with 167 and 160, respectively. the respondents with teaching experience of between 5 to 10 years showed the highest number with 220, followed by 11 to 15 years with a frequency of 63. the number of respondents with teaching experience of more than 20 years was 23, and 21 trainers had between 16 to 20 years of experience. The majority of respondents (183) had a diploma as their highest academic qualification, followed by 133 trainers with a bachelor's degree, 6 trainers with master's degrees, and 5 trainers with other qualifications. More than half of the trainers (201 respondents) had Malaysian Skills Certificate (MSC) Level 3, followed by 54 with Malaysian Skills Diploma (MSD), 43 with Malaysian Skills Certificate (MSC) Level 2, 12 with other qualifications, 6 with Malaysian Skills Advanced Diploma (MSAD) 10 with Malaysian Skills Certificate (MSC) Level 1, and 1 with Statement of Achievement (PC).

Table 1 - Skill Trainers (Respondents) Demographic Distribution

Demography	Category	Distribution	Percentage (%)
Gender	Male	167	51.1
	Female	160	48.9
Teaching Experience	5 To 10 Years	220	67.3
	11 To 15 Years	63	19.3
	16 To 20 Years	21	6.4
	More Than 20 Years	23	7.0
Highest Academic Qualification	Diploma	183	55.9
	Bachelor	133	40.7
	Masters	6	1.8
	Other Qualification(s)	5	1.5
	MSC 1	10	3.1
	MSC 2	43	13.1
	MSC 3	201	61.5
	MSD	54	16.5
Highest Skill Qualification	MSAD	6	1.8
	PC	1	0.3
	Other Qualification(S)	12	3.7

Furthermore, the analysis of Part B shows the frequency of the implementation of T&L social skills and social value authentic elements of the dual system apprenticeship program. Table 2 is the findings of the implementation of authentic T&L social skills and social values elements of the dual system apprenticeship programme.

Table 2 - The Mean Score Distribution of The Authentic T&L Social Skills and Social Values' Elements

Item no.	Item statement	Mean score (*M*)	Standard deviation (*SD*)	Interpretation
Element 1: Preparation of T&L social skills and social values content and activities that reflect the way knowledge and skills are used in the real world				
1	Prepare content based on flexible learning environment	2.46	.499	moderate low
2	Update activities that develop knowledge	2.42	.495	moderate low
3	Prepare activities that could develop skills in real-life context	2.33	.470	moderate low
4	Enact flexible environment that allows movement based on assignment's needs	2.54	.499	moderate low
	Average Mean	**2.438**	**.491**	**Moderate Low**
Element 2: Provide authentic T&L activities in tandem with current developments				
5	Implement authentic activities	2.47	.500	moderate low
6	Allow data to be sourced from various sources	2.26	.438	moderate low
7	Relate to other fields to build more comprehensive knowledge	2.53	.500	moderate low
	Average Mean	**2.420**	**.479**	**Moderate Low**
Element 3: Provide access to experts in related field and provide modeling for complicated processes				
8	Organize talks by industrial experts	2.31	.465	moderate low
9	Invite experts that could share experience of professional practices	2.21	.409	moderate low
10	Provide easy access to industry experts	2.43	.496	moderate low
11	Involve different experts from various fields	2.31	.465	moderate low
	Average Mean	**2.315**	**.459**	**Moderate Low**
Element 4: Prepare multiple roles and perspectives in implemented T&L activities				
12	Allow current issues to be explored from different angles	2.47	.500	moderate low
13	Allow the effective use of multiple resources	2.43	.496	moderate low
14	Allow the use of suitable materials	2.52	.500	moderate low
15	Allow the listing of actual roles during assignments	2.30	.460	moderate low
16	Reflect real-life activities	2.57	.496	moderate low
	Average Mean	**2.458**	**.490**	**Moderate Low**
Element 5: Support collaborative construction of knowledge				
17	Require cooperation from all parties	2.54	.499	moderate low
18	Emphasize on group-based assessment compared to individual assessment	2.28	.452	moderate low
19	Emphasize on supporting others to complete their tasks in pairs or groups	2.60	.491	moderate low
20	Use various learning resources and equipment for various assignments	2.50	.501	moderate low
21	Review issues from various perspectives	2.24	.425	moderate low
	Average Mean	**2.432**	**.474**	**Moderate Low**
Element 6: Encourage reflection to form a strong abstract towards lessons				
22	Provide opportunities to present ideas	2.43	.496	moderate low
23	Relate ideas with various resources and equipment sourced	2.15	.357	moderate low
24	Provide opportunities to make corrections beyond deadlines	2.30	.459	moderate low
25	Promote reflections with group members before corrections are made	2.43	.496	moderate low
	Average Mean	**2.328**	**.452**	**Moderate Low**

Element 7: Encourage articulation to develop existing knowledge			
Provided opportunity to present assignments in groups	2.54	.499	moderate low
Provided opportunity to present ideas clearly and defend them	2.49	.501	moderate low
Allocate time for Q&A session with other groups to encourage development of ideas	2.48	.500	moderate low
Invite suitable parties as panelists during the presentation of assignments	2.31	.463	moderate low
Improve the ability to further discuss on complex assignments by explaining developing understanding	2.55	.498	moderate low
Average Mean	**2.474**	**.492**	**Moderate Low**
Element 8: Provide guidance during critical situations and encourage with various approaches			
Given comprehensive explanation before any task is assigned	2.56	.498	moderate low
Execute tasks well through minimum supervision	2.31	.463	moderate low
Execute tasks well through minimum guidance	2.44	.497	moderate low
Receive guidance whenever needed in completing assignments	3.70	.459	high
Receive guidance from more experienced peers	2.45	.498	moderate low
Average Mean	**2.692**	**.483**	**Moderate Low**
Element 9: Implementation of suitable and integrated assessment throughout the completion of assignments			
Given chances to improvise products before assessment is conducted	2.28	.447	moderate low
Only refers to final report throughout the assignment	2.46	.500	moderate low
Use suitable rubric	2.42	.495	moderate low
Assess individual contribution even when assignment was group-based	2.26	.441	moderate low
Multiple methods compared to only a sole method of assessment	2.31	.461	moderate low
Average Mean	**2.346**	**.469**	**Moderate Low**

4.   Findings and Discussions

4.1   Provide Authentic Context That Reflects The Way The Knowledge Will Be Used in Real-Life

The mean score of element 1 is 2.438 (.491). It demonstrates that providing authentic context that mirrors the way the information will be utilized as a part of real-life is moderate-low among the skills trainers. Wenger (1998) advocated that a formal learning structure can't be planned. J. Herrington and Oliver (2000) determined that trainers can just plan an environment to enable learning rather than to instruct the apprentices' learning process. This affirmation inferred that apprentices should master their learning process and that trainers should coach or bolster apprentices in their learning procedure. These thoughts proposed that training must go past, the present unit instruction. Similarly, practicing real-world situations during classroom lessons can enable apprentices to remember and relate new data to their existing knowledge, as apprentices are likely to review and apply that new data later on, in actual circumstances outside the classroom (Brown et al., 1989).

4.2   Provide Authentic Activities.

The mean score of element 2 is 2.420 (.479). It demonstrates that giving authentic activities is moderate-low among the skills trainers. Current instructive methodologies call for apprentices to be aggressive in the real world by incorporating

realistic problem-solving skills into their learning, while conventional teaching methods concentrate on retaining information and adapting every required material before being acquainted with the real-world task. Apprentices will most likely be unable to completely apply their learning to the competitive work environment without appropriate, meaningful training in the classroom. By receiving such exercises in view of authentic learning strategy, apprentices ought to be better placed to learn and welcome the need to secure proficient aptitudes in the classroom, in addition to the procedures required in the long-term proficiency improvement.

4.3 Provide Access to Industry Experts and The Modeling of Processes

The mean score of element 3 is 2.315 (.459). It shows that providing access to industry experts and the modeling of processes is moderate-low among the skills trainers. Authentic and service-based learning incorporating real-world experiences urge apprentices to cooperate with experts in the field instead of depending solely on their classroom skills trainers for learning (Herrington et al., 2006). It is on account of whether we can have access to experts' opinions and modeling processes, and in the meantime, the experts also have access to apprentices with different levels of aptitude. Therefore, apprentices will have an open door for the sharing of accounts and stories and able to socialize with experts of the industry. A. Herrington and J. Herrington (2006), and Owens and Valesky (2007) recommended that trainers should open apprentices to the setting of collaborative articulation of knowledge by methods for discussions, forums, conferences, the Internet, and customary classes. Likewise, increasingly capable apprentices can guide and mentor their companions.

4.4 Provide Multiple Roles and Perspectives

The mean score of element 4 is 2.458 (.490). It reveals that giving multiple roles and perspectives is moderate-low among the skills trainers. Authentic learning helps overcome any issues between securing information and learning how to apply it on regular day-to-day existence, as shown by Choo (2007), who guaranteed that real-life skills and encounters ought to be at the center of authentic learning. A service-learning strategy might be similar to authentic learning as it also makes connections between real-world learning and in-class learning (Soslau & Yost, 2007). However, the authentic learning strategy gives exceptional advantages regarding interfacing with the real world related to apprentices' life and objectives. It provides unique benefits in terms of connecting with the real world associated with apprentices' professional life and goals. To be sure, the roles and perspectives of apprentices should reflect how a learning domain could mimic a situation where apprentices connect with real-world issues.

4.5 Support Collaborative Construction of Knowledge

The mean score of element 5 is 2.432 (.474). It demonstrates that supporting collaborative construction of knowledge is moderate-low among the skills trainers. An authentic learning strategy cultivates apprentices' dynamic cooperation and engagement in learning by arranging issues and inquiries in real-world contexts (Brown et al., 1989). For apprentices, encounters with challenging tasks in authentic learning are more significant to viable, real-world tasks when contrasted to classroom-based projects. Moreover, authentic learning stresses the significance of coordinated effort in accomplishing objectives from different points of view as opposed to from a solitary viewpoint of learning (Herrington et al., 2006). It must be underlined that the requirement for coordinated efforts ought not to be unnaturally constrained on the group of apprentices by the framework yet grounded in the idea of the tasks. The apprentices welcome the estimation of joint efforts just on the off chance that it is unmistakably expected to fulfill the errand or accomplish preferable outcomes alone. They will truly take part in collaborative activities, for example, share data, examine halfway research results, and deliver shared choices and engineered arrangements. Understanding and valuing the requirement for coordinated effort might be a huge piece of the learning procedure.

4.6 Promote Reflection

The mean score of element 6 is 2.328 (.452). It illustrates that advanced reflection is moderate-low among the skills trainers. It has been noticed that authentic context and task expect choices to be made. Here, one of the vital parts is teamwork, which is imperative in authentic learning encounters since it is generally polished in a real business environment setting. Business partners, clients, and customers frequently cooperate to manage their different points of view (Soslau & Yost, 2007). Considering that such collaborative endeavors are essential in creating powerful working connections (Hyman & Hu, 2005) apprentices must learn how to draw upon various sources and reach an agreed-upon end product through critical thinking and negotiating processes. Encouraging awareness towards others' expectations within a team, and developing responsibility for shared objectives are the key parts of accomplishing an effective result. By replicating real-world research in the current study, apprentices were able to practice collective problem-solving skills by taking on multiple roles, thereby enhancing their confidence as a team member. Here, apprentices could cooperate as a group in a domain, coordinating classroom lessons and working environment learning. Under such an intentionally planned setting, apprentices may be inspired to develop capabilities to fit in with what others are practicing. Mezirow (1991) expressed that apprentices must experience a basic reflection procedure of perceiving,

questioning, examining, and revising their past experiences, in the long run changing their reality views and forming new ones. From the contemporary constructivists' points of view, trainers should make responsibilities to structuring real-world contexts and helping apprentices develop their unique, individual reasoning examples by presenting apprentices to different viewpoints established in such true settings (Jonassen, 1991). Most assuredly, the setting is viewed as one of the premises for authentic teaching and learning in useful learning hypotheses.

4.7 Promote Articulation

The mean score of element 7 is 2.474 (.492). It demonstrates that promoting articulation is moderate-low among the skills trainers. A capacity to impart one's expertise and experience with others and articulate knowledge in virtual multi-cultural communities emerged in the data analysis as a factor affecting peer development (Sobrero, 2008). How can the journey effectively be visible to peripheral participants in a multi-stage process formed from multiple roles, and how can it be entered at various circumstances? Articulation of pedagogically tacit knowledge is challenging. As ability grows, there might be a downside to the development of articulation of knowledge from newcomers to the discourse. In practice, this was obvious in the project, for instance, when online session questions were benchmarked against the course content. Observers were just ready to see the incomplete setting, as the organized talk was not "unmistakable" to them. In any case, a superior recording of action is abandoned in web-interceded activity than in conventional up close and personal groups, in which members frequently hold a divided memory of the action (Zhang & Watts, 2008). As indicated by Choo (2007) the authentic learning approach accentuates social association through group work, thereby improving student learning. Research has proven the significance of providing more opportunities for interactions between colleagues. Cranton & Carusetta (2004) showed that interaction among all apprentices, and in addition to the teacher, enables a student's ability to learn and process information better. The authentic learning project in the present study requested that apprentices work within and between groups to characterize and execute goals, parameters, and tasks of assigned projects. The dynamic interactions in the present investigation, which are between clients and consultants, and among colleagues, enabled apprentices to take care of the issues and effectively accomplish the goals of the projects.

4.8 Provide Coaching and Scaffolding

The mean score of element 8 is 2.692 (.483). It highlights that providing coaching and scaffolding is moderate-low among the skills trainers. Educators usually simulate practice sessions by distinguishing what is to be realized in the real-world circumstances and lead these authentic activities within the surrounding environments. The principles utilized as a part of the simulation model include conducting domain-related practices, ownership of inquiry and collaborative and social work (Barab & Duffy, 1998). In the classroom, authentic learning empowers educators to watch a learner react and handle issues, organize arguments, control evidence, and plan activities to address and take care of equivocal issues. With authentic learning, apprentices' competence is not surveyed from one execution, but rather through a progression of exercises (Duis, 1995). Apprentices are presented with various assessment tasks, so they can exhibit their skills. Such assessment tasks have logical noteworthiness (Hensley, 1997), and authentic assessment is coordinated based on presentation, information, or emotions that the educator wishes to gauge. Authentic assessment, in this manner, concentrates on the item, and the nature of execution, and understudies are all the more effectively required in the learning procedure. Moreover, understudies know how they will be assessed in front of the real evaluation, which frequently brings about more experience for apprentices' interest and motivation.

4.9 Provide Authentic Assessment of Learning Within the Tasks

The mean score of element 9 is 2.346 (.469). It demonstrates providing an authentic assessment of learning within the tasks is moderate-low among the skills trainers. Authentic assessment is a type of evaluation in which apprentices have to perform real-world tasks that exhibit significant utilization of fundamental knowledge and skills. As stated by Herrington and Herrington (1998), the authentic assessment takes place within the setting of an authentic setting with complex difficulties, and focuses on dynamic trainees that produce refined outcomes or items, and is related to different learning ventures. Authentic assessments, frequently called performance-based assessments, expose apprentices to real-world tasks and scenario-based problem solving more than traditional measures, like in pencil-and-paper tests (Darling-Hammond, 1997). Performance-based tasks are, to a great extent, open-ended and often can be utilized to cater to different methodologies (Reed, 1993). For maximum benefit, these errands ought to be highly significant and important to apprentices (Henderson & Karr-Kidwell, 1998). Authentic assessments can appear as presentations, projects, writings, demonstrations, debates, simulations, presentations, or other types of open-ended tasks. While the authentic assessment is profoundly contextual, excellent authentic assessments enable apprentices to exhibit knowledge and skills that reveal understanding (Dana & Tippins, 1993).

5.   Conclusion

Authentic T&L approach was the focus of this study as the approach could relate formal lessons carried out in the classroom to real-world settings. Authentic T&L provides opportunities for learners to voice their opinions, apart from having access to experts in the industry based on the programs designed by each training institution, like assignments through case studies (Riesbeck, 1996). Authentic T&L environment must encourage apprentices to explore different perspectives that are not confined by discipline, and allows the collaborative construction of knowledge development. In authentic T&L, more experienced skills trainers act as mentors or facilitators that could assist trainees by generating ideas to support the trainees' learning experience. Formative assessments are carried out concurrently whenever activities are conducted, which provides trainees with opportunities to improve their achievement from time to time. A few ramifications rendered from the discussions are imperative for future research and instructing.

These preliminary discoveries demonstrate that the teaching and learning of authentic learning ought to be extensively executed in the Malaysian National Dual Training System. The execution of authentic teaching and learning in the National Dual Training System is moderate-low among the skills trainers. Hence, authorities should look into other aspects that could be included to further enhance authentic teaching and learning practices in Malaysia.

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