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Effect of Handedness on Completion Rate of Chemistry Timed Tasks by Left-Handed Learners

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Abstract

Handedness has been shown to affect left-handed learners' performance generally and specifically during practical work in chemistry. This is because left-handers experience learning difficulties associated with handling and manipulating righthanded resources. The purpose of this study was to investigate whether left-handed learners' use of right-handed resources has any effect on their completion rate and performance in chemistry. Data was collected from left- and right-handed students of chemistry from a co-educational secondary school in Kenya during practical work. Data showed no statistical significance difference between on- and off-task time by the participants. However, left-handers have to not only work a little bit faster, they also have to put in more effort and time in order to complete timed chemistry tasks. An independent t-test showed no significant differences between left- and righthanders' task scores. These findings helped demonstrate that the use of right-handed instructional resources by left-handers may have an undesirable effect specifically on completion rate of timed chemistry tasks and performance. Therefore, for inclusivity, left-handedness has to be treated as a special learning need. Due to the small number of participants, it was suggested that in order to increase construct and concurrent validity, time-on-task samples from a larger participant group across grades should be obtained. It was further suggested that in order to alleviate the negative effects of switches, teachers should be knowledgeable of strategies to maintain on-task behavior, meaning that learners with the same challenges need to be put together so that they all transit together during learning.

Keywords: performance, timed tasks, on-task, off-task, task completion rate, left-handers, right-handers

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BACKGROUND INFORMATION

Introduction

The crucial objective of any schooling program is to offer all learners a safe and appealing environment, coupled with sufficient opportunities to learn (Martinez & Brock, 2009). To achieve this, a large portion of a student's typical school day has to be allocated towards providing these opportunities. However, allocation of learning opportunities is not the only recipe for good performance. Handedness has been shown to affect students learning generally and specifically during engaged time. It is on this premise that this study is based, to establish whether a mismatch between handedness and the design of instructional resources influences left-handers' task completion rate and performance in school chemistry.

Slavin (2003) defines time on-task (engaged time) as the amount of time spent learning. It is more than a behavioral concept because it also encompasses the emotional commitment to academics (Weghe, 2006). This is because it is the most important influence on academic achievement (Greenwood, Horton & Utley, 2002; Slavin, 2003). Consequently, classroom activities that appropriately and effectively engage learners are also geared towards achieving a favorable learning environment. Despite earning its place in the world of science, chemistry is pivotal in the learning of other sciences. This is partly because chemistry learning develops transferable scientific work habits in students (Hibbard, et. al, 2015). In this regard and the fact that teachers may not be privileged to dictate the nature of students who join their classrooms, the facet of handedness can neither be ignored nor wished away, based on the fact that 10% of any randomly sampled population comprises left-handed persons (Bishop, 1990).

The relative importance of chemistry to the unfolding world notwithstanding, the performance of Kenyan students in chemistry at the secondary school remains a dismal failure in examinations (Otieno, 2013). Many factors have been cited to contribute to this poor performance, vis-à-vis student factors, teacher factors, parental influence and cultural beliefs (Muya, 2000), teachers' qualification, efficiency of teaching and learning methodology used (Mahajan & Singh, 2005) and science teachers' classroom management effectiveness (Orji, 2014; Tunde, 2014). The context and the resources available and their influence on a learner's cognitive load (Rouet, 2006) have also been reported as being significant.

Handedness has also been shown to affect learner performance (Malusi, 2014; Parish, 2011; Kula, 2008). This is because in the learning environment, left-handers experience learning difficulties (Kula 2008; Johnston, Shah & Shields, 2007) brought about by not only the settings in these contexts but also the activities therein. For example, the act of writing left to right has been shown to present a special obstruction for left-handers (Lance, 2005) since they have to bend over their work in order to see what they are writing; an exercise that usually leads to possible back, neck, shoulder and hand aches. As far as performance in school subjects is concerned, in one school in England, Williams (1987) found that left-handed children generally performed less well in French, Science and History compared to right-handed children. However, Annett and Manning (1989) found contrasting findings. Using a sample of 175 boys and 173 girls from six schools in central England, they

established that right-handed children performed poorer in Matrices and English compared to left-handed children.

A review by Johnston, Nicholls, Shah and Shields (2009) broadly divides the various theories on the origins of handedness into: genetic explanation, exogenous factors and the social environment. Whatever the cause, left-handedness affects learners in the classrooms because the world is made up-down by the right-handed for the right-handed (Silverman, 2009). Experimentally, 50% of all three-year-olds show a clear preference for using either the right or the left hand, a percentage that rises to about 90 in favor of the right hand by the time children start formal school (Bishop, 1990). Remarkably, most researchers working with children are interested in the development of hand preferences because of both its impact on hand skill and the possible relationship to brain function (Kula, 2008).

Attention to external sources of information by learners is guided by their understanding of the task context, for instance, mental representation of the requirement by the problem statement and the perception of realistic constraints of the situation such as time availability and learning benefits (Björklund, 2013). Rouet (2006) opines that the set of tools and information resources available in the environment which sometimes include resources to facilitate the means to the end present are another source of cognitive load. Rouet further argues that prior knowledge, learners' physiology, more general cognitive abilities and level of expertise help shape the individual characteristics of learners. Ultimately, it appears that effective learning results from the interplay between these aspects and a mismatch between any of them may cause challenges during learning. For example, a mismatch between learning resources and leaner physiology can artificially increase extrinsic load because the learner may have to put in more effort and time thinking of the how and the when to reverse instructions (Silverman, 2009) so as to effectively respond to the task requirements.

This study is premised on the assumption that many instructors and the left-handers themselves do not realize that the correct learning resources would improve performance. Generally, practical subjects in school, such as practical arts, home economics, woodwork and metalwork (which involve using heavy machinery) as well as the sciences have raised concerns, both with blade positioning and over the positioning of safety overrides, which are positioned for right-handers' convenience. This means that left-handers can lose valuable seconds in an emergency, as they would instinctively reach out with their dominant hand in moments of stress.

Statement of the problem

Learning and examination contexts are set for right-handers and instructions are also given in their favor. In chemistry laboratory learning and assessment, it is expected that a learner should have automated the necessary skills for manipulating learning resources thereby dedicating most of the conscious cognitive information processing efforts to the learning content. However, for left-handers who have to manipulate equipment designed for right-handers, the balance between the conscious and unconscious information processing is somewhat disturbed. This leads to a situation where left-handers are forced to not only consciously focus on on-task activities, but also active off-task activities, for example, the manipulation of learning resources for the task. The need to consciously pay attention to manipulating these resources constitutes extrinsic cognitive load which has been found to negatively influence task performance. In the case of timed tasks or the need to apply knowledge in new contexts, left-handers will most likely be disadvantaged because they have to deal with and process more information during the allocated time. The learner will most likely have to put in extra effort and time at processing information as well as trying to fit and comfortably remain on-task in an 'unfamiliar' environment. On this backdrop, this study is based; to establish whether a mismatch between handedness and learning resources design influences left-handers' task completion rate and performance in school chemistry. This is because such mismatch has been found by several studies to influence learner's ability to process information effectively.

Purpose of the Study

The general purpose of this study was to investigate whether the use of right handed learning resources by left-handed high school chemistry students has any significant effect on their completion rate and thereby their overall achievement in timed chemistry tasks.

LITERATURE REVIEW

Compared to the times 20-30 years ago, the number of left-handed persons has increased. This does not represent a growing trend, it rather reflects a greater individual freedom that permits people to act in accordance to their preferences, individuality and inborn peculiarities (Kula, 2008). However, while left handedness is commonly associated with challenges, generally, left-handers enjoy some advantages over right-handers. For example, a study by Craig and Richeson (2012) reported that experiments on multi-tasking performance showed that when given two tasks to complete simultaneously, left-handers outperformed right-handers. Nevertheless, when instructed to focus on one task at a time, right-handers comparably completed the tasks faster.

In academics, learning challenges are more pronounced since the act of left- to rightcalligraphy becomes a major happenstance for left-handers (Milsom, 1995). This is necessitated by left-handers' inability to see their written work because their hand covers the work, a challenge overcome by hooking the hand, an adaptation that is not only awkward but painful as the arm lacks full range of motion control (Hackney, 1997). Left- to right- writing also makes left-handers move the body away from the midline, which is not only uncomfortable in the hand and body positions, but also makes them slow and fatigued when involved in prolonged periods of writing (Malusi, 2014; Milsom, 1995).

Left-handers constantly need to adapt to situations by using their non-preferred hand, which explains the less between-hand differences (Coren, 1989). They therefore get more practice with their right hand and hence find themselves using their non-preferred hand more frequently (Stone et al., 2013) and with more proficiency (Steenhuis & Bryden, 1989). However, left-handers are less consistent in their manual preference compared to right-handers (Crovits & Zener, 1962).

Handedness and Use of Learning Resources

Hand preference is believed to affect human overall cognitive skills (McManus, 2002). During hands-on tasks, learners have an opportunity to familiarize themselves with apparatus, practical techniques and data analysis strategies. Left-handers are likely to experience difficulties using products that require left- right- turning and flexing the muscles. This is because such equipment is solely designed for right-handed use. Since left-handers turn things anti clockwise against the thread, for example fixing a screw, or winding up apparatus by unwinding them, this undertaking is not only strenuous but is sometimes beyond their control (Hughes, Reißig & Seegelke, 2011).

Research has established that the relationship between hand preference and performance is dependent on the degree and direction of manual preference (Flowers, 1975), the movement type and its complexity (Peters, 1981), practice (Chisnall, 2012), number and nature of questions asked and the study participants (Steenhuis, 1999). A study by Annett (1970) found that the speed of placing pegs into close-filling holes was hinged on handedness irrespective of whether one was right- or left-handed, corroborating Flowers (1975) that hand skill depends on the degree of manual preference.

Left-handers show a greater readiness to use the non-preferred hand compared to right-handers when performing an unskilled motor task (Calvert, 1998). Consequently, they may also find themselves performing laboratory tasks whose knowledge and skill has not been effectively proceduralized through automation. Failure to automate knowledge of such skills leads to ineffective information storage, interpretation and retrieval (Eraut, 1994) which may subsequently result in work incompletion leading to lowered performance, especially bimanual tasks which generally involve either using the two hands to hold a single object, using two different objects in combination or an object and a tool to perform tasks (Rigal, 1992). These activities require the co-ordination between both hands which has a direct bearing on hand preference and task performance (Peters, 1981).

Task complexity influences the relationship between preference and performance (Peters, 1981; Steenhuis, 1999), that is, certain tasks whether unimanual or bimanual provoke a stronger hand preference and are faster and more accurately performed using the preferred hand. This is not the case for left-handers because they not only have to work against the norm but also use ungraspable tools. For example, in order to establish how left-handers fair when carrying out fine motor tasks, Darvik (2015) examined right-and left-handers' unimanual and bimanual hand preferences as well as exploring between-hand performance differences. He established that both right-and left-handers performed better with their preferred hand and that right-handers had larger between-hand differences compared to left-handers on all tasks except for intrinsically right-handed tasks (Healey et al., 1986). To further establish this, Rosenbaum and Jorgensen (1992) demonstrated that people grasp objects in an awkward fashion to ensure the "end-state comfort effect" after the movement. This implies that the motor system anticipates future body states and plans final grasp postures prior to movement execution (Hughes, et al, 2011). That is, when a lefthander has to grasp an instructional tool, they have to do it in such a way as to be comfortable at the end of the task

Timed Laboratory Tasks

During practical examination situations, students particularly may have to deal with more information than they can processes in the stipulated time; i.e., simultaneously recalling relevant theories and techniques, recognizing instructional resources and following task instructions (Johnstone, 1997). Consequently, this may overload their working memory leading to inefficiency in responding to the task demands effectively (Johnstone & Al-Shuali, 2001). Additionally, since learning is influenced by learners' prior knowledge, which may or may not be well-constructed in their long term memory (LTM), this combination often hinders students' attempts to engage effectively between laboratory tasks and related theory (Limniou & Whitehead, 2010). The state can further be compounded if the learner is facing additional challenges of having to deal with ill-fitting learning resources as well as transiting within tasks.

Despite necessary adjustments during instruction, left-handers need to appropriately fit with the available learning resources (Dhara et al, 2008), as well as effectively handle the total cognitive load (Hasler, Kersten & Sweller, 2007). This challenge is more demanding during timed tasks, for example, where left-handers have to manipulate entirely right hand biased learning resources, the requirements on mental effort, mental load and the pressure to meet expectation puts extra demands on them. Jumbling these compounding factors may negatively affect academic performance. This is because the probability of not finishing tasks increases. Notably, failure to finish timed tasks does not always imply a deficiency in content knowledge.

Martella et al., (2003) agrees that transitioning from one activity to another, although essential and inevitable undesirably impacts learner's academic engagements, that is, when between-task transitions (tasks that include shifting from one subject to another) and within-tasks transitions (the discrete activities that happen within given tasks) are done without a glitch, they can have a positive effect on engaged learning. This is because they possibly increase allocated time and decrease chance for disruptive behavior (Lee, 2006). Therefore, it is important to maintain levelness in decreasing the time spent between tasks (Slavin, 2003), a feat that instructors can succeed in if they keep students on-task during within-task transitions by avoiding interruptions or "slowdowns" once an activity has started.

Left-Handers Performance in Chemistry

Typically, left-handers are thought to be more powerful in perception compared to right-handers (Rice, 1998), as well as possessing an enhanced mathematical ability, which involves a high level of visuo-spatial ability (Hermelin & O'Connor, 1986). In the scientific and popular literature, there are consistent reports that left-handers are over-represented among populations of creative artists (Preti & Vellante, 2007) and architects (Peterson & Lansky, 1977), a finding contested by Wood and Aggleton (1991). Although left-handedness is a common trait among learners with specific learning requirements, as a result of their preference for the right-brain thinking (Emore et al, 2006), Paul (2002) agrees that left-handedness is not an obstacle in mental development and not all left-handers experience learning difficulties. For that reason, failure to complete tasks and probably low academic outcomes as a result

should not be taken to mean an inability to effectively retrieve information from the memory stores.

A study by Casasanto and Chrysikou (2011) showed that people link motor fluency with graspable objects when the handles of the objects are oriented to make them easy to grasp. Faced with this reality and the bulk of everyday use tools including laboratory learning resources oriented for right-handed users, left-handers have to adapt to use these apparatuses. This adaptation is costly as it not only takes time and effort but may be seen to affect task completion leading to a decrease in academic achievements.

METHODOLOGY

Data for this mixed methods study was collected from 17-20-year-old chemistry students in a co-educational school in Kenya. For the purpose of comparability, the participants were comparable across their cognitive ability, age, experiences and prior knowledge and therefore the single most attribute that was likely to cause the difference in the results, that is performance in chemistry was handedness. The target population was stratified according to male/female, left-/right-handers. The number of left-handers, male and female participants sampled determined the number of the right-handers.

The sampling procedure was multi-staged. All left-handers were purposefully selected in order to establish their population. A Torque test for handedness was done to establish hand and brain dominance (**Appendix A**). Right-handers were stratified into gender then matched random sampling to ensure that the numbers were comparable across handedness and gender was done. There were 11 left-handers (9 males, 2 females) and 11 right-handers (9 males, 2 females).

Instrumentation and Data collection

A laboratory based task (**Appendix B**) required participants to interact with apparatus in order to determine how the rate of reaction between sodium thiosulphate and hydrochloric acid varies with temperature. Participants were also required to determine the concentration of hydrochloric acid. This requirement necessitated evaluation of the learners' performance during and after the task.

A behavior observation protocol (**Appendix C**) was used to monitor participants' time-on-task using the momentary interval time sampling strategy. The observational period was divided into equal time intervals. The protocol had a list of 13 on- and off-task activities. Engaged time behavior was coded as either on-task (a) or actively off-task (b). A sample of 12 participants was randomly selected from the 22 participants (3 left-and 3 right-handed males, 3 left- and 3 right-handed females) for the group discussion (**Appendix C**).

STUDY FINDINGS

The influence of right handed learning resources use and completion rate of tasks in chemistry

During the task taking, on-task and off-task activities were recorded in the observation protocol and the recordings summarized as shown in Fig. 1.



Figure 1: Participants' engagement with the task

During the 1st interval, all participants read instructions. Majority of the right-handers (82%) started fixing and manipulating the apparatus while the bulk of left-handers (73%) started by rearranging the apparatus (what was on the right hand side was moved to the left-hand side of the work station). The rest of the left-handers moved to work from the opposite side of the work station. During the 2^{nd} interval, more right-handers than left-handers were off task. Majority of the left-handers had already started manipulating the apparatus after fixing them.

During the 3rd and 4th intervals, nearly all participants were on-task. One right-hander was idly sitting, looking around and/or fumbling with the apparatus. Few left-handers (4) were still shifting the apparatus from one point to another. During the 5th interval, all participants were on-task except 2 left- and one right-hander who were off-task. Half-way through the task, all participants were on-task. One right-hander appeared to be rubbing all his work and starting the task all over again.

During the 6th interval, all participants except one right-hander were on-task while during the 7th interval, three left-handers and two right-handers were engaged in off-task activities. This trend changed during the next two intervals where all but one participant was seen engaging in off-task activities during the 8th interval. At the end of the task all participants were on-task.

Table 1: Linear Frequencies of Test Scores								
	Participants'	Participant	Number					
	handedness	s' score on-task		off-task				
N Valid	22	22	22	22				
Mean		9.591	8.27	2.32				
Std. Error of Mean		.4234	.457	.467				
Median		9.250	8.50	2.00				
Mode		8.0 ^a	9	2				
Std. Deviation		1.9859	2.142	2.191				
Variance		3.944	4.589	4.799				
Range		7.5	8	8				
Minimum		5.5	3	0				
Maximum		13.0	11	8				
a. Multiple modes exist. The smallest value is shown								

In order to calculate the average participants' engagement time, the formula below was used;

		wnere;
_	<u>Σf</u> ×tί	$\sum \mathbf{f} \mathbf{X}$ = sum of the participants on task over an
X	=	interval
	Ntíx	ti = observation interval for participants on task
		N = total number of participants observed
		\mathbf{X} = number of observation intervals

In the overall, left-handers spent 76% (34 minutes) of task time on-task while righthanders spend 78% (35 minutes) of task time doing task related activities. On average, roughly 8 left-handers were on-task at any given time while findings showed that on average, nearly 9 right-handers were engaged in on-task activities.

Table 2: Participants task engagement									
Participants task engagement	Handedness task engagement	N	Mean	Std. Dev	Std. Error Mean				
Number of participants on-task	Right-handed on- task	11	8.56	2.404	.801				
	Left-handed on-task	11	8.44	2.398	.799				
Number of participants off-task	Right-handed off- task Left-handed off-task	11 11	2.44 2.56	2.404 2.404	.801 .801				

An independent t-test showed no significant difference between on-task engagement of left- and right-handers; $-\{t(16)=0.196, NS, two-tailed\}$, meaning that although the average number of right-handers on task (m=9) was slightly higher than that of the left-handers (m=8), this was not statistically significant. In addition, a similar t-test showed no significant difference between off-task engagement of left- and right-handers; $-\{t(16)=-0.098, NS, two-tailed\}$, further implying that although the average number of left-handers off-task (m=3) was slightly higher than that of the right-handers (m=2) there was no significant differences between them.

After scoring the task, right-handers had an average score of 63% compared to lefthanders' 57% task score.



Figure 2: Participants' performance in the laboratory task

An independent t-test showed no significant differences between left- and righthanders' task scores; $\{t(20)=-0.965, NS, two-tailed\}$. Despite the right-handers' mean score of (m=10.000; sd=1.342) being slightly higher than that of the left-handers (m=9.182; sd=2.182), this difference was insignificant. This performance index was despite the fact that the participants were matched according to their performance in chemistry based on past tests. Hence, the findings imply that there were intervening variables that curtailed left-handers' performance.

Table 3: Participants Average Task Score								
	Participants Handedness	Ν	Mean	Std. Dev.	Std. Error Mean			
Participan t scores	Left-handers	11	9.182	2.472 6	.7455			
	Right-handers	11	10.000	1.341 6	.4045			

Task completion rate is affected by the interruptions at the work station which in this case came in terms of the positioning of the learning resources, the provision of the ungraspable apparatus some of which required left-to right- turning and therefore, left-handers were forced to turn their bodies in awkward positions. These interruptions also affect the speed at which information is retrieved from the LTM because the learner has to attend to instructions, task requirement and manipulate learning resources simultaneously.

Relationship between use of right handed learning resources and performance in chemistry

Compared to the other science subjects, i.e., Physics and Biology, chemistry was also seen to be "easier", partly because some apparatus as used in Physics "do not move" while in Biology "the theory does not match the practical part" (L2). L3 (female) suggested:

"I have always felt that I have to put in more effort and time in most of the tasks that I have to do not just in chemistry but in other sciences and especially in Physics. ... I feel things do not flow easily for me. I find the right-handed being favored more by the apparatus and settings used in the *laboratory*" L3

L3 felt that more effort and time was required in order to achieve learning goals. This was because she faced challenges manipulating the apparatus, which corroborates a study by Malusi (2014), that is, left-handers experience difficulties coordinating the movement of both hands simultaneously, especially when clockwise turning by both hands is required. This is because the learning resources used were those that required clockwise turning by both hands.

Teaching and Learning in the School Chemistry Laboratory

The participants preferred group work to individual work, a preference that changed to the preference for individual work over group work as they moved up the academic ladder. Due to being clumsy (Coren, 1992), left-handers prefer having right-handed colleagues in their groups (in the lower forms) so as to get help in handling the more challenging learning resources. As they moved up the forms coupled with practice, and after gaining confidence in the use of the apparatus, the preference changed. For this, L2 said;

"I like group work because I get assistance from other people (righthanders). However, the right-handed colleagues tend to take control of the set up and ignore us (left-handers). During group work it is my responsibility to choose a position that is most comfortable so that I can also contribute in the task" L2.

Participants also opined that if they had a permanent sitting position during test taking, then it would be easier for teachers to have their stations arranged specifically for the left-hander. This can only happen if teachers are aware of each learner's special needs in the classroom generally and specifically if left-handedness was seen as a special learning need. For example, L4 (male) said;

".... lab apparatus should be arranged to suit our individual needs so that we can save on time spend rearranging and getting around the work stations" *L4* (male)

At the same time, L3 (female) said that,

"I find it most comfortable to work while standing on the left hand side of the room. I also find the use of some apparatus quite challenging and I feel it affects my performance. I think there should be a specific area for the left-handed students. I think we should be given some extra time as well as have our apparatus pre-arranged for our sake before the sessions" L3 (female)

In order to determine participants' self-efficacy and opinions about adaptations during practical situations, L5 (male) said;

"Apparatus and questions (assessment) sometimes affect the results because of compromised precision and speed" L5 (male)

To add on to that, L6 also said that

"I would have been more comfortable if I was to use apparatus that I can use without feeling like am forcing things to work. Some apparatus makes me feel inadequate" L6 (male)

But L2 a female had this to say

"To some extent, the quality of my work is affected by the apparatus we use. Many questions that require a lot of manipulation affect my overall performance because I find it challenging coordinating the hands" L2 (female)

Although there was no significant difference between right- and left-handers' performance, left-handers performed a unit less than right-handers. This could have been due to the use of learning resources meant for comfortable use by right-handers (Parish, 2009).

Taking Timed Tasks

The FGD revealed that participants carefully considered each available option before making a decision. These adaptations were costly in terms of time and self-esteem as left-handers feared being accused of cheating in the examinations. For example, as far as adaptations were concerned, L6 opined that;

"... unless I position myself conveniently I will be uncomfortable. ... I must rearrange apparatus ... to work well in the task. When it is not possible to shift, the fear of being ridiculed by others makes me suffer in silence.... Again ... the burette taps are usually on the right hand side and sometimes we use our right hand. Using two apparatus at the same time is a nightmare, e.g., swirling conical flask and a stop watch. ...can't do both ... my fingers slip when stopping the watch. ...can't stop it on time. The changes ... waste practical time and sometimes make me not finish the exam. When circumstances force me to use the right hand, there is a lot of tension making me feel disadvantaged ... so I end up fidgeting" L6 (male).

Sitting positions and the manipulation of instructional resources was also a challenge that affected the students overall grade. L3 suggested that;

"Sitting positions are a challenge ... at times we do not get what we prefer. In the lab, it is easy to get confused and panicky when changing positions and rearranging the apparatus. The burette tap is also a challenge to me and more so during multitasking. The changes I do make me not get a good mark in practicals and also my overall grade...." L3 (female).

During practical work, shared work stations are common occurrences. Consequently, left-handers find themselves sharing these work stations with right-handers. When were asked about their views on group work, L1 agreed that;

"Shared work stations are a problem and I have to rearrange apparatus to suit my needs. The burette and the conical flask is a problem to handle and I must use both hands. ... I feel it affects my performance because I am not comfortable holding the apparatus and the chemicals can also corrode my skin. It would help if we are given time to rearrange the apparatus before the beginning of a task" L1 (female).

Although R4 a male right handed student had no problem sharing a work station with left-handers, he was of the opinion that they tend to mess with reagents. He emphasized that;

"Work stations are not a problem ... sharing apparatus is ... sometimes I ...move the apparatus to the disadvantage of the lefties. ...when you are working with them (lefties) they ... mess the reagents. It is annoying... they always do something funny with what we are given to work with..." R4 (male)

Further probing on how shared work stations contributed to the inability to finish timed tasks, L5 opined that extra time would help them complete their work.

Evidently, some learning resources hinder the performance and perfection of students' work in chemistry. The arrangements of work stations prior to a major examination have the potential to influence learner' performance. Right-handers claimed that left-handers disorganize the provided task requirements thereby compromising task results during group work. The facet of safety in the laboratory was also mentioned as a constraint for left-handers. These constraints and mismatches have the potential to increase cognitive load which in the long run hinders effective information processing. In the case of left-handers, automation

(which lowers cognitive load) is negatively affected because of using 'ungraspable' learning resources which divert their conscious attention towards incoming information.

DISCUSSION OF STUDY FINDINGS

Left-handers spend more time handling, fixing and manipulating learning resources compared to right-handers. Therefore, left-handers have to deal with more extrinsic load (Johnstone, 1997) which consequently overloads their working memory, in turn hindering effective response to task demands (Johnstone & Al-Shuali, 2001; Hasler, et al. 2007). The ensuing struggle costs time. Further, left-handers still have difficulties coordinating the movement of the right and left hands simultaneously, especially when clockwise turning by both hands is necessary (Ruecker & Brinkman, 2001).

Taking and finishing timed tasks

During end of course examinations, work stations are prepared for right-handers. Left-handers are left to choose the adjustments to make in order to cope. Left-handers also find themselves sharing work stations with right-handers who view them as being a bother (Coren, 1992). It would therefore seem plausible if left-handedness was viewed as a special learning need.

Participants experience with selected laboratory tools

Learning resources that require flexing the muscles of both hands, those that require eye-hand coordination, reading from left to right (meter rules, measuring cylinders), as well as multitasking manipulations cause left-handers discomfort during use as it interferes with both precision and speed (Rueckert & Brinkman, 2001).

Adaptations and adjustments left-handers make so as to work comfortably and remain on-task during laboratory tasks make left-handers preferring individual work to group work as they move up the academic ladder. Individual work would help them build self confidence in the performance of tasks, automate procedural knowledge and skills (Mousavi, et al., 1995) as well as familiarize themselves with learning resources. Such familiarity frees most of working memory hence reducing extraneous load (Sweller, 1998).

CONCLUSION

On average, findings indicated that more left-handers spend extra time off-task compared to right-handers. Their performance was also a point less compared to right-handers. Therefore, left-handers have to not only work faster, they also have to put in more effort and time in order to complete timed tasks and post favorable performance.

RECOMMENDATIONS FOR FUTURE RESEARCH

This study demonstrates that the use of right-handed learning resources may have a negative effect on left-handers' performance in timed chemistry tasks. The study is limited by the small number of participants studied. To increase construct and concurrent validity, time-on-task samples from different grades and more students should be obtained. Further, correlating time-on-task data to classroom achievement, gender and grades would be helpful as well. Replications of this study are needed that compare time-on-task differences using shorter time intervals. These additional investigations should provide intuition into the use of right handed learning resources and its effect on the overall achievement of left-handers in practical chemistry.

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Appendix A: Torque test for Handedness

To be used by the researcher to determine participants' handedness Name of participant------Age of participant------Sex -----M------F------Date ------

Procedure

The teacher will ask each of the left-handed participants to come with a piece of paper and a pencil. He/she will then ask them in turns to write his/her name with one hand the circle it.

The teacher then asks the student to draw using the other hand and draw a circle round the name. He/she then notes and records the direction of the circle.

1. Which hand produces the best handwriting?	L	R
2. Were both circles drawn clockwise?	Yes	No
3. Were both circles drawn clockwise?	Yes	No
4. Was one circle drawn clockwise and the other counter-	clockwise? Y	'esNo

NB: This is to help the researcher determine the left-handers and the ambidextrous

- The hand that produces the best handwriting is the dominant hand
- If the circles were drawn clockwise, the right-brain is dominant,
- If the circles were drawn counter-clockwise, this indicates left-brain dominance.
- One circle clockwise and the other counter-clockwise shows mixed dominance.

(Adopted from Kalafut, 2008)

Appendix B: Students' Classroom Observation Schedule

(Adapted from http://lefthandedchildren.org copyright @ 2006 and modified) This checklist is to be filled by the researcher as evidence of participant observation in the laboratory during the practical session. It is to be completed for every individual participant.

Observation Checklist

Is there evidence that participant is changing position during the interaction with the apparatus? Are they facing the front of the classroom? Observed Not Observed...... Does it inconvenience others working next to them? Observed...... Not Observed......

Classroom Observation Sheet

For each of the participants the observer will check and record in the observation sheet the main activity the participant is involved in. A participant can have multiple entries

Activity	5	10	15	20	25	30	35	40	45
(a) On Task									
(b) Off Task									
1. Rearranging apparatus (b)									
2. Looking around (b)									
3. Fixing the apparatus (a)									
4. Manipulating the									
apparatus(a)									
5. Fidgeting with hands (b)									
6. Sitting idle (a, b)									
7. Reading instructions (a)									
8. Consulting with teacher (a)									
9. Moving about without									
doing task related									
activities (b)									
10. Changing positions (b)									
11. Consulting with colleagues									
(a)									
12. Doing calculations (a)									
13. Too much rubbing (b)									
Any other activity student is									
doing									
Total number of times ON task									
Total number of times OFF task									

On-task all activities student does either listening to/reading instructions, manipulating apparatus and/or working on the calculations that are aimed at promoting learning of the content/achieving the learning goal (procedural and content issues)

Off-task: any other activity student does other than the actual task that can interfere with the achievement of the learning goal (non-academic issues)

Appendix C: Task worksheet

This practical task consists two parts. In part 1 (a), you are required to determine how the rate of reaction between sodium thiosulphate and hydrochloric acid varies with temperature. You are also required to determine the concentration of hydrochloric acid. In part 1 (b), you are required to standardize the hydrochloric acid provided. Follow the instructions correctly and write your answers in the spaces provided below each question.

Name-----Sex----- (M) ------ (F) -----Date-----

1a). You are provided with:

- Sodium thiosulphate containing 7.9g of the solute in 100cm³ of solution.
- Hydrochloric acid.

You are required to:

- Determine how rate of reaction between sodium thiosulphate and hydrochloric
- acid varies with temperature.
- Determine the concentration of hydrochloric acid

Instructions to participants

Procedure 1:

Measure 10cm^3 of sodium thiosulphate using a measuring cylinder and transfer it into a clean conical flask. Make a cross(x) on a white piece of paper and place the flask on the cross(x) on the paper. Using another clean measuring cylinder, measure 10cm^3 of hydrochloric acid and note its temperature; transfer the hydrochloric acid into the conical flask containing sodium thiosulphate and immediately start the stop watch. Swirl the mixture and record the time taken for the cross(x) to be blocked. Repeat the procedure at varying temperatures and fill the table below.

Table

Volume of sodium thiosulphate (cm ³)	10	10	10	10	10	10
Volume of hydrochloric acid (cm ³)	10	10	10	10	10	10
Temperature of hydrochloric acid (°C)	25	30	40	50	60	70
Time taken for cross to be blocked (sec)						
Reciprocal of time <u>I</u> or <u>I</u>						
Time t						

a) Using the table above plot a graph of reciprocal of time (y-axis) against temperature. (3mks)



(iii) What is the concentration of the hydrochloric acid? (1mk)

OBSERVATION CODES

On-task is when student is actively attending to the assigned work (writing, reading aloud, raising a hand to answer a question, talking to the teacher/peer about the assignment, looking up a word in the dictionary, typing an essay in the computer) Off-task is those times when a student is passively attending to the assigned work (listening to a lecture, looking at an academic worksheet, reading the assignment silently, looking at the blackboard during teacher instruction, listening to a peer respond to a question)

Off-task motor defined as any instance of motor activity that is not directly associated with an assigned academic task

- ✓ Engaging in any out of seat behavior (buttocks not in contact with seat)
- ✓ Aimlessly flipping the pages of a book
- ✓ Manipulating objects not related to the work (playing with paper clip, twirling a pencil, throwing paper, folding paper)
- ✓ Physically touching another student when not related to academic work
- ✓ Turning away from one's seat oriented away from the classroom activity
- \checkmark Bending or reaching for something on the floor
- ✓ Drawing/writing that is not related to the task
- ✓ Fidgeting in one's seat (engaging in repetitive motor movement for at least three consecutive seconds)

Off-task verbal any audible verbalizations that are not permitted and/or are related to the assignment

- ✓ Making any audible sound, e.g., whistling, humming, forced burping etc
- ✓ Talking to other students about issues unrelated to an assigned academic task when such talk is prohibited by the teacher
- ✓ Making unauthorized comments or remarks
- ✓ Calling out answers academic problems when the teacher is not specifically asked for an answer or permitted such behavior

Off-task passive those times when a student is passively not attending to an assigned academic activity for a period of at least three consecutive seconds within an interval

- ✓ Student is quietly waiting after the completion of an assigned task but is not engaged in an activity authorized by the teacher
- ✓ Sitting quietly in an unassigned activity
- ✓ Looking around the room
- ✓ Starring out through the window
- ✓ Passively listening to other students talk about issues unrelated to the assigned academic activity
Appendix D: Focus Group Discussion Guide

This schedule was used as a guide by the researcher to elicit responses from the focus group constituted from the team of students that did the chemistry laboratory task.

Who or what influenced your choice of chemistry as an examinable subject?

How would you rate your Performance in chemistry from form two to the current? *Probe for reasons for this*

What is your opinion about Performance work in chemistry (is it necessary)? Probe for reasons of responses given

Sometimes you are required by the task to do more than one activity at a time. Are there challenges that you encounter during such times? *Find out how the participants surmount the said challenges*

> In your opinion, do you think you have to put in a little more effort than the right-handed students and especially in practical examinations (tasks)? *Probe for reasons for the responses*

➤ Will you continue doing chemistry related courses? More advanced and complicated resources will be used during the training or in the line of work. What does that make you feel?

 \succ Given an opportunity, what would you tell your fellow students, your teachers, your parents and policy makers to do in order to make chemistry learning friendlier to students and especially the left-handed learners? What about examinations?

 \succ How does the work load in chemistry compare to that of other science subjects?

➢ Is your overall performance affected by your handedness especially because of practical work?

Management Education for Global Sustainability

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Abstract

Challenges to corporate business success requires the development of a new type of manager/leader who can integrate business expertise with knowledge of science and technology. The Professional Science Masters (PSM) Degree in Sustainability Science is an example of this new model of graduate education. While the PSM degree has grown significantly in U.S. graduate education, this paper tests its viability as a professional degree program designed to prepare sustainability professionals for Vietnamese businesses. A survey was delivered in Ho Chi Minh City, Vietnam to discover if local companies find sustainability education to be a current or future human resource need for their organizations; if so, what education and job skillsets are business organizations looking for; and to assess their support for an experiential program, internship or consultancy for students in such a program. The results of this survey indicate that there is a growing need for sustainability professionals in Vietnam and that companies would be interested in developing research and internship opportunities with local universities.

Keywords: Education, Leadership, Management, Sustainability, Vietnam

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1. Introduction

Business sustainability is a company's ability to achieve its business goals and increase long-term value by integrating economic, environmental and social opportunities into its business strategies (Taylor, 2013) Corporations are part of a larger social and natural system where risk to these systems can hinder business goals and organizational success. Challenges to corporate business success are many and varied (Wirtenberg, 2014). While short term earnings are important, long-term systematic risks are emerging. Climate change and extreme weather affect the viability of supply chains; water supply, air quality, and natural resource constraints due to a rising global middle class fosters increased material, energy, and production costs; growing population inequality is causing social tension and conflict; and radical transparency through internet and cloudbased connectivity and social media makes every business vulnerable, particularly multinationals (AMA).As a result of these developing global risks, a new type of graduate education needs to be developed to create professional sustainability managers that have both science and business skillsets.

An example of this new model is the Professional Science Masters (PSM) in Sustainability Science which posits a rigorous study in science and mathematics with coursework in management, policy and law, with an emphasis on communication, project management and other employer-desired skills (CGS). To test the effectiveness of this model for Vietnam, a survey was delivered in Ho Chi Minh City, Vietnam to discover if companies find sustainability education to be a current or future human resource need for their organizations? If they do, what education and job skillsets are business organizations looking for in their hiring process? And finally, to assess their support for an internship program that would emphasize practical education if such a graduate program was developed?

2. Need for Professional Sustainability Leaders and Managers

The Green Biz Group, an organization that tracts corporate sustainability, reports that 33 percent of global corporate leadership is now actively pursuing sustainability within their organization and positioning green initiatives as an important component to their overall business strategy [5]. Sustainability professionals are now visible at every level of a company or non-profit organization. Their main functions are to coordinate initiatives; encourage employee engagement; and to drive the organization towards greater corporate and community citizenship (Hamilton et al].

In a Green Biz Report in 2014, 32 percent of sampled companies indicated their need for sustainability professionals, and 20 percent of these positions were in newly created jobs. In Vietnam, there is a general need for skilled technical employment and management to increase its global competitiveness (GreenBiz). In a National University of Singapore Report on Vietnam competitiveness, it saw a great need for Vietnamese graduates to have sufficient technical skills to accomplish many of the industrial activities that are required in an emerging global economy. An American Chamber of Commerce Report noted how

the Vietnamese business community is increasingly concerned about shortages of skilled labor. It reported: "Cooperation among educational/training institutions, enterprises and other units employing people is rare. As a result, graduate often lack the skills being demanded in the market. A survey conducted by the Vietnam Student Association (VSA) showed that 50 percent of graduate in Vietnam cannot find jobs in their field and those who have to be retrained account for a significant share...In a discussion paper presented at the Vietnam Business Forum in June 2010, about 65 percent of the Vietnamese labor force is unskilled and about 78 percent of the population aged 20-24 is untrained or lacks the necessary skills" (Hal et all).

In the United States, the research community has long recognized that reform in graduate STEM (science, technology, engineering, mathematics) education is necessary to meet the needs for new professionals (CGS). With the number of traditional academic jobs decreasing, graduate programs in the United States are seeking a new model which emphasizes interdisciplinary, entrepreneurial, and technological innovation. This need for a new type of professional education was revealed in a survey of employers in the state of Oregon, USA. It found that when making hiring decisions, 90 percent of the employers rated work experience and the ability to communicate clearly as the two most important skills for hiring. Next to these skills was the need for students to have knowledge of government regulations and business conditions and practice (See Fig. 1 in the Appendix). And lastly, almost half of the employers rated a graduate degree with advanced scientific coursework as important (Bechert et al).

The Professional Science Masters (PSM) is such a model gaining traction in the United States for graduate education. The PSM stresses written and verbal communication skills, and team-building required in professional settings. It emphasizes more technological innovation than a Masters of Business Administration (MBA) and more professional business skills than a traditional science Master's degree. It includes project or team experience versus the traditional thesis and requires real world experience through internships or projects with companies and potential employers. This paper tests whether this model for a new type of STEM Professional that merges business skills with technical scientific expertise can be a useful model for graduate education in Vietnam by viewing the results of a survey for the PSM in Sustainability Science.

3. Vietnamese Companies and Sustainability Education

In conjunction with the College of Environment at Ho Chi Minh City University of Natural Resources and Environment, the researcher conducted an on-line survey of companies and some governmental agencies between August and December 2015. The purpose of the survey was to evaluate whether a graduate educational program in sustainability science would be well-received by Vietnamese employers and to determine if the PSM model would be an effective graduate model for professional education in the Ho Chi Minh City Region. Companies were identified mainly through the Business Directory of the American Chamber of Commerce – Ho Chi Minh City Chapter and through university-based associations (AmCham). Letters were sent out to 172 companies in the Ho Chi Minh City Region and an additional 23 other companies were

contacted directly through emails, making a potential base of 195 respondents. A total of 45 surveys were collected on-line, a response rate of 23 percent. Letters of inquiry and the on-line survey were delivered in both English and Vietnamese, with 69 percent responding in Vietnamese and 13 percent in English. The survey results were analyzed using SPSS computer statistical program software.

4. Company Respondent Profiles and Survey Results

A majority of the companies surveyed were Vietnamese, with 82 percent having their corporate headquarters in Vietnam, 7 percent in Asia outside of Vietnam, and 11 percent in Europe. 60 percent were industrial companies (See Fig. 2 in the Appendix) and the company respondents were mostly at the Supervisor level in their organizations (See Fig. 3 in the Appendix). 38 percent of the companies surveyed indicated that they have published some type of sustainability report and 47 percent revealed that they had an employee responsible for sustainability issues in their organization.

In order to determine the need for a new type of professional graduate education to meet the requirements for the rise of corporate sustainability, three basic questions were asked. First, what sustainability issues are important to your company? Second, what strategies are most important for a successful sustainability agenda in your organization? And finally, what are the barriers to achieving sustainability in your organization?

The highest sustainability concerns for the respondents were for business ethics; a safe and healthy environment; and reducing waste. The next tier of important concerns were for: maintaining a safe and reliable food supply; clean water; and climate change. The least important concerns were for renewable energy; natural disaster assistance; biodiversity; population growth; and reducing greenhouse gas emissions (See Fig. 4 in the Appendix).

When the respondents were asked to respond to which business strategy would lead to the most successful sustainability agenda for their organization, they listed: the need for senior management support; embedding sustainability into the core business strategy; establishing procedures for measuring sustainability performance; and meeting customer demand and new market opportunities as the most important considerations (See Fig. 5 in the Appendix). And lastly, they saw the lack of awareness or understanding of sustainability as the greatest barrier to sustainability in their organizations (See Fig. 6 in the Appendix).

5. Graduate Professional Education for Sustainability

The first part of the survey concentrated on the respondent's perspective of sustainability in their organization, while the last set of survey questions addressed what the respondents thought were the most important professional and educational skillsets needed for a sustainability professional in their organization. The survey revealed that the highest skillsets needed were problem-solving skills; systems-thinking skills; and communication skills (See Fig. 7 in the Appendix). And finally, when developing a curriculum for a graduate professional program in sustainability science, the two areas that respondents found most important were emphasized were ethics education and problem-solving skills education (See Fig. 8 in the Appendix).

6. Conclusion

Today, companies are concerned over risks to their operations that can emanate from supply chain disruptions due to typhoons and flooding events; compliance risk that relates to clean air and water issues; and global trade risks due to new packaging and carbon emission requirements. All of these risks reflect the need for a new set of professional managers and business leaders who have expertise in sustainability science. As an emerging professional field, it is important to design a curriculum which meets company requirements and perspectives. The companies surveyed in this study seemed to prefer a model that is based on the Professional Science Masters (PSM), which emphasizes the internship as an important component for graduate education. In the survey, 87 percent of the respondents indicated that they believed that an internship experience was necessary for a successful graduate educational experience. Also, 62 percent stated that their companies would support an internship program and would recommend staff for the PSM in sustainability science if one was established in Vietnam.

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FIGURES IN APPENDIX





Source: Vietnam Competitive Report, NUS Asia Competitive Institute, 2010



Fig. 2: Skills Most Important for Hiring for U.S. Businesses

Source: Oregon State Employment Survey, 2011



Fig. 3: Business Function of Respondents within their Companies

Source: Taylor, 2015





Source: Taylor, 2015



Fig. 5: Respondent Views of Important Sustainability Issues for Vietnamese Businesses

Source: Taylor, 2015



Fig. 6: Respondent Views of Important Sustainability Strategies for Vietnamese Businesses

Source: Taylor, 2015



Fig.7: Respondent Views of Barriers to Sustainability within their Companies



Fig.8. Respondent Views of Skill-Sets Necessary for Sustainability Professionals



Fig.9: Respondent Views of Important Curriculum for Sustainability Science

Source: Taylor, 2015

Teacher-Educators as Policy Entrepreneurs - How Do Motivation, Innovative Work Behaviour, and Personality Profiles Relate to Policy Entrepreneurship Outcomes?

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Abstract

The role of policy entrepreneurs in shaping the process of policy implementation is well recognized. However, current research tends to focus more on the process of policy change, and less on the quality of the outcomes of such policy shaping. Individual traits like motivation and contextual factors are known to shape the actions of policy entrepreneurs, but how do these affect the outcomes of policy implementation? To address this, we study the response of 89 teacher-educators in 11 districts in a province in India to a policy of the National Curriculum Framework for Teacher Education to incorporate the experiences of teachers in the teacher education curriculum. The opportunity spotted was teacher-driven innovations in schools and the entrepreneurial response took the shape of two-day "Educational Innovation Fairs" conducted in 2016 in all the districts. These brought together about 464 innovative practices in schools to public for awhich were visited by 4089 teachers. The practices were rated by the visiting teachers and the respective scores were allocated to teacher educators on the basis of their contribution. The specific question we seek to answer is, "Do teacher-educators' motivation, innovative work behaviour and personality factors affect the quality of the outcomes of their policy entrepreneurship?" The findings indicate a positive, but nonsignificant relationship between innovative work behaviour and conscientiousness. On the other hand, results indicated a negative, but non-significant relationship between motivation conceptualized through goal orientation and innovation score.

Keywords: policy entrepreneurs, multiple streams framework, policy implementation, personality profiles, innovative work behaviour, goal orientation

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Introduction

Policy entrepreneurs have been seen as "significant agents of change" (Mackenzie, 2004, p. 369), with the kind of entrepreneurial work they do including, among other things. consensus-building, generating issues, creating and exploiting open "policy windows," influencing the definitions of policy issues, innovating in pursuit of policy implementation, and using their networks to achieve their goals (Baumgartner & Jones, 1993; Kingdon, 1995; Mintrom, 2000; Weissert, 1991; Mintrom & Vergari, 1998). Given the assumed "strong relation between entrepreneurial activities and personality profiles" in the policy literature (Timmermans, van der Heiden & Born, 2014, p.98), the role of their personalities while they engage in such activities has attracted some attention (Christopoulos, 2006; Kingdon, 2003; Roberts & King, 1992; Mintrom, 1997). At the same time, there is recognition of the increasing role that policy entrepreneurs play in policy implementation (Ridde, 2009; Saetren, 2016), since intended policy objectives may often be shaped in unintended directions by local-level interpretations. That is, recent research is also concerned with the outcomes of policy entrepreneurship. But how personality profiles of policy entrepreneurs are related to the outcomes they seek to achieve is a question that remains under-explored. In this paper, we draw on the experiences of a group of teacher-educators who linked teacher-driven innovations in the public system with official teacher development policy, to push for a greater recognition of innovation in the teacher education curriculum. The outcomes of their actions were a set of validated innovations displayed in a public exhibition and then converted into manuals for use by teacher-educators as well as educators. We first describe the theoretical framework that underpins this study. We then present details of the case that we draw upon, the "Educational Innovation Fair" (EI Fair), which sought to create a "policy window" by presenting teacher-driven innovations as an answer to the problem of low academic achievement and by enlisting the support of an official teacher-education policy and the political system. We then describe our methodology, before presenting our findings about the linkage between personality profiles and policy entrepreneurship outcomes. Finally, we end with a discussion of the implications for supporting policy entrepreneurship within a framework of educational change.

Outcomes of Policy Entrepreneurship and Personality Profiles

Much of the work on policy entrepreneurs and policy entrepreneurship over the last three decades has been influenced by the multiple streams framework (Kingdon, 1984). Though the focus of research was initially on the early stages of the policy cycle such as agenda setting or problem definition, in recent years the role of policy entrepreneurs in policy implementation has attracted attention since there is often a gap between the intended policy objectives and their local level interpretations (Ridde, 2009; Grinstein-Weiss, Edwards, Charles, & Wagner, 2009; Lee, 2015; Harmon, 1995; McLaughlin, 1987; Kornhaber, Barkauskas, Griffith, Sausner, & Mahfouz, 2017). For instance, Mele and Compagni (2010) presented the case of a policy entrepreneur engaging in implementing a smoking ban policy. Lee (2015) showed how the "third sector" in South Korea played the role of policy entrepreneur and implementer with regard to a policy regarding social enterprise. Grinstein-Weiss, Edwards, Charles and Wagner (2009)

studied the specific role of policy entrepreneurs in policy adoption and implementation. Thus, in line with Zahariadis (1999), Ridde (2009) and Zahariadis and Exadaktylos (2015), we assume that the multiple streams framework can be used to examine the implementation stage of the policy cycle, and that the coupling of the policy and problem streams is more significant during implementation (Ridde, 2004, p. 202)—the politics stream, though present, is only loosely coupled with the others; we will show later, when describing the EI Fair initiative, how the problem and politics streams and the policy and politics streams interacted at the earlier stages of agenda-setting and formulation, respectively. In this paper, we are concerned specifically with the outcomes of the coupling of problems and solutions during implementation.

Zahariadis and Exadaktylos (2015, p. 9) note that "implementation *success or failure* is difficult to define and measure." If the time-frame of the policy cycle is relatively long, it should be possible to examine outcomes such as equity versus efficiency, as explored by Ridde, 2004, 2009), or others such as accountability, redistribution, compliance, and so on (Zahariadis, 2008). With shorter timeframes, as in our case, it may be useful to look at the intended outputs, as recommended by Zahariadis and Exadaktylos (2015) and assess the quality of such outputs to capture the variation across the implementing units.

Given the importance attached in the multiple streams framework to entrepreneurial behavior in bringing together problems, solutions and politics when opportunities are open, the characteristics of the individuals who engage in such behavior have attracted scholarly attention. Christopoulos (2006) attributes the success of policy entrepreneurs to the convergence of four factors: behavioral traits, institutional factors, network position, and political capital. Behavioral traits, the individual qualities that are independent of structures or institutions, include "rhetorical ability, foresight, persistence, and good negotiating skills" (Kingdon, 2003). These individual qualities depend, for their expression, on the institutional environment. Mackenzie (2004) visualized the factors associated with successful policy entrepreneurs at two levels, the individual and the contextual. The individual level qualities include innovation and creativity, argumentation, persuasion, and remaining alert to opportunities. The contextual factors such as institutional environment, positional power, and political structure play a significant role in complementing the individual qualities (Zahariadis & Exadaktylos, 2015). Mackenzie (2004) clearly shows that the impact of policy entrepreneurs is mediated by environmental factors, and thus, while individual qualities are important, they are circumscribed by the context that regulates social action.

However, the role of personality profiles in influencing outcomes of policy entrepreneurship seems to have attracted little attention. Roberts and King (1992) assessed the personality profiles of public entrepreneurs using Loevinger Sentence Completion Test of Ego Development (SCT), the California Psychological Inventory (CPI) and the Myers-Briggs Type Indicator (MBTI). They defined public entrepreneurs as people who are involved in all three phases of innovation, namely, creation, design, and implementation of innovative ideas. They studied executive entrepreneurs and public entrepreneurs and showed that public entrepreneurs are also vulnerable to unethical

behaviors (Lewis, 1984; Ramamurti, 1986) while seeking to achieve their objectives. Both types of entrepreneur showed achievement orientation, change agency, managerial and leadership skills, and critical and analytical skills. However, public entrepreneurs were more respectful towards others and tolerant of others' views, and more collaborative when engaging with others. A more recent study by Timmermans, van der Heiden and Born (2014) developed an instrument to assess the personality profiles of policy entrepreneurs. The instrument seeks to compare the personality characteristics of policy entrepreneurs with policy professionals. They synthesized the Big Five model (McCrae & Costa, 1987; Goldberg, 1990, 1992) and the HEXACO personality model (Ashton & Lee, 2001) to assess nine constructs – aesthetic appreciation, inquisitiveness, creativity, unconventionality, extraversion, agreeableness, conscientiousness, emotional stability and openness to experience. They noted that policy entrepreneurs tended to show a higher inclination towards agreeableness, creativity, unconventionality, openness to experience, and transformational leadership. Timmermans et al. (2014, p. 96) describe their work as paving "the way for more comprehensive research into the relation between personality structure, contextual variables and entrepreneurial behavior and success" and as we describe later, we draw on their work for our methodological approach.

In sum, we draw on the extension made to the multiple streams framework to include implementation (Ridde, 2009), but rather than focus on a simple dichotomous outcome of success or failure, we seek to assess the quality of the outputs of policy entrepreneurship. The short timeframe of two years covered by the initiative reported in this paper makes this approach more appropriate (Zahariadis & Exadaktylos, 2015). Second, we relate these outputs to the personality profiles of policy entrepreneurs, since this is an underaddressed relationship in the literature. By doing this, we hope to build on the recommendation of Timmermans et al. (2016) to examine the linkages between personality structures and policy entrepreneurial success, as mediated by contextual factors.

Genesis of the Educational Innovation Fair

The Educational Innovation Fair (EI Fair) was an exercise carried out in the western Indian province of Gujarat by the province's Council of Educational Research and Training (CERT) and personnel drawn from its 26 sub-provincial colleges, called District Institutes of Education and Training (DIETs)¹ over a two-year period 2015-17. Before we describe the actual EI Fair, we present how the coupling of the problem and politics streams, and the policy and politics stream happened in the agenda-setting and formulation stages.

In developing countries such as India, with the province of Gujarat being no exception, the public schooling system's performance has been subject to criticism (see for instance,

¹ The mandate of the CERT covered teacher training and research in the approximately 33,000 government elementary schools (grades 1 to 8, age group 6 to 14) of the province. The DIET covered an administrative unit called the district; each district has approximately 1000 schools. The CERT, headed by a director, has about 30 academic staff. Each DIET is headed by a principal, and the 26 DIETs had about 400 academic staff.

ASER, 2016). The state has responded by introducing programs that seek to introduce innovations into the system; for instance, a national program, the Sarva Shiksha Abhiyan (Education for All), has sought to introduce a number of curricular and pedagogical innovations. However, such programs are constrained by the fact that "innovation is not an elemental context for the public sector" (Potts & Kastelle 2010, p. 124) and by the presence of a number of barriers to innovation-the structure of the public system, the fear of experimentation, the costs of mistakes, and the characteristics of the people in the public system (van Duivenboden & Thaens, 2008; Kirby, 2006; Birley, 2002; Ozcan & Reichstein, 2009). At the same time, there are many local teacher-driven innovations that are relevant responses to problems that teachers face in socio-educationally deprived contexts. A project of an academic institution, the Indian Institute of Management Ahmedabad (IIMA), had been studying these innovations, seeking to demonstrate that policy entrepreneurship which valorizes such innovations and creates a culture of innovation by promoting their use is a promising approach to educational reform (Chand, 2014). In February 2014, this project, in collaboration with CERT, organized a conference to honor 100 innovative teachers and exhibit their innovations. This conference, which was attended by the province's minister of Education and top bureaucrats, demonstrated that the problem of poor quality was being addressed by locally generated, teacher-driven innovative responses to highly contextual educational problems. The role of CERT, itself an organ of the government, and represented by its director, in linking the political concern about quality with the problem of poor achievement, set the stage for the work that followed to develop teacher-driven innovations as a possible solution to educational problems in difficult socio-economic contexts.

This work took the shape of formulating an approach that would appeal to the political and bureaucratic leadership as a feasible solution and attract financial resources from the state. At the same time, enlisting the support of the constituents of CERT was seen as an essential element of the approach. IIMA had, beginning in 2013, worked with two academic staff in each of the 26 DIETs helping them identify teacher-driven innovations and screen them for effectiveness (see Chand, 2014 for details). This group and the principals of the DIETs were mandated by the director of CERT to formulate the strategy. Since these academic staff were themselves engaged in teacher development (both pre-service as well as in-service training), the relevance of the National Curriculum Framework for Teacher Education (NCFTE) was apparent. This policy had been formulated in 2009 by the statutory body for teacher development, the National Council of Teacher Education, and noted that the teacher educator of the future would have to engage with a number of contextual developments which the future teacher is bound to deal with (NCTE, 2009, pp.76-77). The policy specifically called upon teacher-educators to incorporate relevant experiences of teachers-how they dealt with their socio-political contexts, their assumptions about children, knowledge and learning, and how they actually helped children construct knowledge-into the teacher education curriculum. Teacher-driven innovations provided a fortuitous fit with these prescriptions. In fact the NCFTE (NCFTE, 2009, p.69) also suggested that teachers could use a variety of methods, including "melas"-a word that in many Indian languages means 'fairs', to promote learning. Thus was born the idea of the EI Fair—an initiative that would identify experiences that have addressed the issue of educational quality, document and validate them, and then convert them into teaching material. The director of CERT then took this proposal to the province's highest administrative decision-making authorities and after much negotiation, managed to receive an annual budgetary allocation of Indian Rupees 16.6 million (approximately USD 0.25 million). This was a minuscule fraction of the approximately USD 620 million that was allotted to the entire elementary education sector in the province, but it was a significant breakthrough since it indicated political commitment to the idea of valorizing teacher-driven innovations, and established a policy, the outcomes of which would now have to be reported to the provincial legislature. It was also the first time that such a policy was being implemented in the country. This coupling of the politics and solution streams now set the stage for the implementation of the EI Fairs.

Kingdon (1995, p.122) defined policy entrepreneurs as actors who "could be in or out of government, in elected or appointed positions, in interest groups or research organizations." Others (Roberts & King, 1992) have assumed them to be outsiders. Saertren (2016, p.73) in his "insider take" on the policy entrepreneur stresses the institutional perspective that becomes important when seeing policy entrepreneurs as insiders. In the case under discussion, the director of CERT, the principals of the DIETs and the group that was formed to link the NCFTE policy with teacher innovations and the political concern about educational outcomes were all insiders. Though the idea of teacher-driven innovations as a solution stream had been conceptualized by an academic institution, without the institutional-insider-knowledge that the CERT possessed, obtaining the necessary budgetary support and formalizing it into a policy stream would have been extremely difficult. That an insider group was coupling the problem-policy streams certainly helped in enlisting political support. In this paper, we treat the teachereducator group which, through the EI Fair, worked for greater recognition of teacherdriven innovations in the public system, as the main policy-entrepreneur group, and see the director of CERT and the principals as having played crucial supportive roles. It is the motivation and the innovation potential of the teacher-educator group that will be related to the outputs generated—the innovations identified, displayed and peer-rated.

Implementation of EI Fairs

The first planning meeting of the director and the teacher-educator group, which comprised 52 staff of the DIETS, was held in September 2015, with the academic support being provided by IIMA. It was decided that each DIET would identify about 40 teachers for their innovative and problem-solving work, by drawing on the work of IIMA, calling for nominations, or word-of-mouth recommendations, and then hold a fair on its premises. A methodology to evaluate the innovations was evolved. A pilot in one district was conducted in December, 2015, and the final approach decided. This pilot served to couple the policy and problem streams, since the experience enabled the group to list the areas in which effective teacher experiences were sought: access to education; deficits in physical infrastructure that state schools suffer from; out-of-school conditions for equity; retention of children in school; quality of education; knowledge inclusion and building an

enabling environment. Second, each DIET constituted committees which included teachers to evaluate the innovations.

Once the process was completed, each DIET held its EI Fair for two days in February 2016. One teacher from each of the roughly 900 to 1000 schools in the district was invited to attend. The fair was basically an exhibition in which the teacher was given a stall to display their work and discuss it with the visiting teachers. Digital content could also be displayed if the teacher had a personal laptop. The visiting teachers had to evaluate all the innovations displayed in the exhibition. In addition to the teachers, local politicians and district-level educational bureaucrats attended the fair.

Based on the ratings given by the visiting teachers, the four innovations which were rated the best were presented at the provincial capital. A total of 108 innovations, including a few that were specially selected for their focus on the urban poor, were presented in March, 2016. This fair was inaugurated by the minister of Education and attended by senior provincial government officials, and served to recouple political concerns with the problem and policy streams. The fairs were well received in general. The material displayed was identified as teaching-learning material by many visiting teachers, not just for the DIETs but for schools as well. All the DIETs published books compiling the innovations from their districts. The entire exercise was repeated in 2017, but this time the province-level exhibition was held not in the capital city but in a remote town.

Within each DIET the group that was working on the initiative enlisted the help of a few other staff members to share the screening and validation of teacher innovations, and undertake the publication and organization of the exhibitions. The quality and quantity of the innovations are the result of the efforts put in by this group of staff. What the DIET and CERT leadership expected of them was a positive orientation to innovation, since the task had to do with selecting teacher-driven innovations.

Data and Methods

The EI Fair was conducted in all the 26 DIETs in the province in 2015-16 and 2016-17. Since 2015-16 was the first year and was a trial, we decided to use the data from the second round. The teams had remained the same in both years. The CERT had instructed the DIETs to obtain ratings of the innovations by the teachers who visited the fair, and provided a template for the purpose, according to which each innovation had to be rated on a score of 50 by all visiting teachers. However, some of the DIETs made some modifications to the scoring template because of reasons such as time pressure; for instance, in some places, given the number of people visiting, the DIETs asked the visitors to pick out only the best five. Eleven DIETs, however, followed the template, and these were selected for the analysis. In these 11 DIETs, the total number of people who carried out the work numbered 89, with each DIET's efforts spearheaded by a coordinator. The coordinator worked under the supervision of the principal of the DIET. Thus, in the 11 DIETs, 100 persons, 89 team members and 11 principals were involved in the activity.

Table 1 presents the number of innovations and the number of raters. In total there were 464 innovations rated by 4089 visitor teachers.

District Name	Number of	Number of	Number of team
(only code given)	Innovations	visiting teacher	members
		raters	including
			coordinator
AMR	55	523	10
PBR	28	318	6
PTN	40	217	11
RJKT	31	150	18
AND	60	590	7
JMNGR	42	425	5
КТСН	48	554	9
MHSNA	42	301	7
VAD	54	318	5
SRT	14	60	3
BHV	50	633	8
Total	464	4089	89

Measures: Personality Profiles

In order to measure the personality profiles of the policy entrepreneurs we largely followed the questionnaire suggested by Timmermans, Heiden and Born (2014) who combined Big Five (McCrae and Costa, 1987; Goldberg, 1990, 1993) and HEXACO personality model (Ashton & Lee, 2001) to assess nine constructs – aesthetic appreciation, inquisitiveness, creativity, unconventionality, extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience. However, in our study, we focused on Big Five Personality Inventory (Goldberg, 1993) which covers four of these constructs – extraversion, agreeableness, conscientiousness, openness to experience, in addition to neuroticism. Since the focus of the present work was on innovation, we replaced neuroticism with "innovative work behavior" (IWB). This resulted in a 34-item instrument in which the ratings were on a five -point Likert scale ranging from strongly disagree (1) to strongly agree (5). The items for IWB were adapted from Janssen (2000), Scott and Bruce (1994), and Ramamoorthy, Flood, Slattery and Sardessai (2005). The response of these items ranged from never (1) to always (7).

In order to measure "goal orientation" in the work domain, we used a 13-item instrument developed by Vandewalle (1997) which has been shown to have good reliability in different countries. The items in this scale were rated on a Likert scale of 1 to 7, never to always. The data was collected through personal administration of the questionnaires to the team members, at the 11 DIETs. In addition, the principal of each DIET also rated the innovative work behavior of the team members, their subordinates. This was collected to check for social desirability bias.

Measures: Output

First, we asked each coordinator to rate the importance of the contribution of each team member to the overall output-the content as evidenced in the books that each DIET brought out, the process in terms of screening and evaluation of the innovations, and the organization of the fair. This rating was done on a scale of 1 to 10, with 10 indicating extremely high importance and 1 indicating very low importance. Second, the ratings of the innovations, given by the visiting teachers (see Table 1), was used as a measure of the overall output of the DIET. The justification for this was the teams at each DIET made a search for teacher-driven innovations, and the manner in which this search was done was assumed to influence the quality of the innovations unearthed. The CERT had indicated that the number was not important—it could be in the range of 30 to 60, but the focus had to be on innovativeness; the guidelines it gave emphasized three elements of innovativeness-novelty, evidence of outcomes, and assessment of effectiveness. Following from this, the visiting teacher raters were asked by the DIETs to rate the innovations on the quality of the innovation and relevance to their own practice. Thus, the ratings were expected to reflect the quality of the innovations and thus the performance of the DIET teams in identifying innovations that had both quality and relevance for the wider teacher community. The mean of the ratings for all the innovations thus constituted an innovation score for the DIET. It was then allocated to the team members on the basis of their contribution to the total effort as rated by the team coordinator.

Results and analysis

Structural Equation Modelling is used to test the three hypothesis:

H1: Goal orientation in work domain is positively correlated with innovation score of policy entrepreneurs.

H2: Innovative work behavior is positively correlated with innovation score of policy entrepreneurs.

H3: Conscientiousness is positively correlated with innovation score of policy entrepreneurs.

All the instruments showed significant reliability greater than 0.7 (Table 2).

Construct	Number of items	Cronbach's alpha
IWB	14	0.847
Goal Orientation	13	0.794
Big Five Personality Traits	34	0.789

Table 2. Reliability of III	struments
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The individual constructs showed a good fit for the measurement model with model fit indices, Table2, in the acceptable cut off range (Hu & Bentler, 1999). This indicates that the corresponding observed variables can be mapped on to latent variables satisfactorily.

	Chi-square	CMIN/DF	CFI	TLI	RMSEA	
IWB	75.57	1.843	0.9	0.87	0.09	
Goal Orientation	47.06	1.14	0.98	0.91	0.04	
Conscientiousness	26.07	1.086	0.98	0.93	0.03	

Table 3	Model	fit indices
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(Hu & Bentler, 1999)	RMSEA	CFI	TLI	SRMR
Acceptable cutoff	< 0.08	>0.9		<0.10
Values considered good	< 0.06	>0.95	>0.90	< 0.08

Testing Hypothesis 1: relationship between goal orientation in work domain and innovation score

The model fit indices for the measurement model between goal orientation and innovation score are in acceptable range. This indicates that the goal orientation as latent variable and innovation score as observed variable are consistent with each other (Table 4).

 Table 4: Measurement model indices (1)

	Chi-square	CMIN/DF	CFI	TLI	RMSEA
Goal orientation <-> Innovation Score	71.562	1.376	0.938	0.922	0.06

In the structural model, the regression weight from goal orientation to innovation score is negative, -0.023, and non-significant. This is against the hypothesized relationship between goal orientation and innovation score.

Testing Hypothesis 2: relationship between innovation work behavior and innovation score

While analyzing this hypothesis, the measurement model's fit indices were in acceptable range as per the values given by Hu & Bentler (1999). The regression weight from IWB to innovation score is positive, 0.07, but non-significant.

	Chi-square	CMIN/DF	CFI	TLI	RMSEA			
IWB<-> Innovation Score	84.101	1.65	0.904	0.87	0.08			

Table 5: Measurement model indices (2)

Testing Hypothesis 3: relationship between conscientiousness and innovation score The model fit indices are presented below which are in acceptable range. This shows that latent variable, conscientiousness, and observed variable, innovation score are consistent with each other.

	Chi-square	CMIN/DF	CFI	TLI	RMSEA
Conscientiousness <-> Innovation Score	34.502	1.078	0.985	0.979	0.03

Table 6: Measurement model indices (3)	rement model indices (3)	leasurement model indices (3)	e 6: Measurement mode
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In the structural model, the regression weight of the path from conscientiousness to innovation score is 0.103 but non-significant. The summary of all the regression weights and corresponding p value is given in table 7.

Hypothesis	Independent variable	Dependent variable	Regression weight	p value
H1	Goal orientation	Final innovation score	-0.023	0.86
H2	IWB	Final innovation score	0.075	0.52
НЗ	Conscientiousness	Final innovation score	0.103	0.34

Table 7

Discussion and Conclusion

This paper was motivated by the under-explored relationship between the personality profiles of policy entrepreneurs and the quality of the outcomes they seek to achieve. A group of 89 teacher-educators were treated as policy entrepreneurs because they attempted to link teacher-driven innovations in the schools in their districts with official teacher development policy that prescribed a greater recognition of teacher experiences. This group was made up of 11 sub-groups, each of which identified a set of innovations that were displayed in a public exhibition and rated by teachers who visited the exhibition. We treated the mean ratings given by the visiting teachers as an indicator of the quality of the work identified by the sub-team and this score weighted by the importance of the sub-team member's contribution to the effort, as rated by the sub-team coordinator, gave the output score for the individual sub-team member. We then related this to the goal orientation in work domain, innovative work behavior and conscientiousness of the teacher-educators. All three relationships turned out to be nonsignificant, with the sign of the relationship between goal orientation and the output score being negative. In effect all three hypotheses were not supported. When the teachereducators took up this challenge, their output was assessed not on the basis of their own direct work, but on the basis of the quality of the work of the teachers in their districts. In

other words, the output assessment of the teacher-educators was determined by the teachers' work. Further exploration of the data will hopefully reveal how valid is this reliance on the teachers' work to assess the work of those who mobilized the innovations. Yet, the nature of the task taken up was such that no other measure of the quality of the output of the mobilizational work that the teacher-educators did was possible. Second, even if there is a relationship between the personality traits and the output, getting a good measure of the quality of that output may be difficult in many situations where the teacher-educators have to rely on the outputs of other stakeholders such as teachers, as in this case, or school governance committee members or others. Alternative ways of relating the personality traits and the outcomes of policy entrepreneurship may to be explored in the future. In conclusion, we note that the relationship of personality traits with policy entrepreneurship outcomes, if one wants to go to beyond a characterization of such outcomes simplistically as success or failure, is an issue that needs creative resolution. In terms of a simple success/ failure dichotomy, the efforts of the teachereducators would be, and have been appreciated, but a more nuanced conceptualization of the outcome proved elusive, reinforcing the warning note of Zahariadis and Exadaktylos (2015, p. 9) that "implementation success or failure is difficult to define and measure."

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Evaluation Research and Development of Strategic Plan for Faculty of Public Health, Burapha University

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Abstract

Research Objectives to evaluate and develop a strategic plan of the Faculty of Public Health Burapha University. The source of data are 349 students, 40 Executives and professors of the Faculty of Public Health and 17 Staffs. The result found that: The research summarized assessment strategic plan KPI by 64.29 per cent, KPI by goal were found that, Goal1: 66.67 percentage pass, goals2: 75 percent pass and goal3: the strategic plan KPI pass by 54.55 percent. The new strategics. Strategy2: Improving Quality of Research and Outreach with 3 Strategies. Strategy3: potential development of personnel with 4 strategies. Strategy 4: participation and social responsibility with 4 strategies. Strategy 5: the development of effective internal management strategy is 1 strategy. The evaluate result of new strategic plan found that; All strategies are suitable for Very good level (100 percent), by 52 indicators found that: the good level of 15 indicators (28.85 percent). The Most of 37 indicators (71.15 per cent) are Very good level.

Keywords: Evaluation Research, Strategic Plan, Faculty of Public Health



Introduction

The Strategic Plan of Burapha university was improvement to develop to excellence the university in fiscal year 2016 - 2020. This revised strategy has been upgraded and reduced. Indicators Of the strategic plan Burapha university Make a strategic plan of the Faculty of Public Health. Not consistent with university plans. There is a need to improve and develop a strategic plan. To be consistent with the university and Professionalism in public health including quality assurance education. Of the Faculty of Public Health it should be developed to improve the strategic plan of the Faculty of Public Health. Burapha University, fiscal year 2016 - 2563. It is divided into 3 major stages. Phase 1 is an evaluation of the original strategic plan of the Faculty of Public Health, Phase II. Strategic Plan Faculty of Health Sciences Burapha University, fiscal year 2016 - 2020, updated by brainstorming in SWOT Analysis. Phase 3 is a summary and documented strategic plan of Faculty of Health Sciences, Burapha university.

Research Objectives

- 1. To evaluate the strategic plan. Faculty of Health Sciences Burapha university
- 2. To develop a strategic plan. Faculty of Health Sciences Burapha university
- 3. To check the quality of plans and monitor the performance monitoring system as planned.
- Strategy of the Faculty of Education Burapha university

Research Framework

This study consisted of 5 factors: 1) Structure of Faculty of Public Health Management. 2) Theory of Management. 3) Theories of evaluation. 4) Strategic Plan Faculty of Health Sciences Burapha University 2011 - 2563 and 5) Strategic Plan Burapha University, lead to evaluation plan. And develop a strategic plan. Faculty of Education Burapa university

Scope of Research

The study population consisted of the Faculty of Public Health. Board of Directors Faculty members of the Faculty of Public Health and the students in Faculty of Public Health, totaling 1,200 members.

- Literature Review and related research
- 1. Theory of project evaluation theory.
- 2. The administration structure of the Faculty of Public Health
- 3. Theory of Management Theory
- 4. Strategic Plan Faculty of Health Sciences Burapha University 2011 2563
- 5. Strategic Plan Burapha University
- 6. Related Research

Methodology

This research is the Research & Development. The process consists of 3 steps.

Step 1 Strategic Plan Assessment of the Faculty of Public Health Half-year Plan 2011-2015 (5 years)

Step 2: Developing a half-plan of the Faculty of Public Health Plan 2016-2063 (5 years) by brainstorming sessions for brainstorming for improvement. Develop and write a plan.

Step 3: Assess the Strategic Plan of the Faculty of Public Health before applying. By the experts and Related persons Presented at the meeting of the Faculty of Public Health, Faculty of Public Health, Faculty of Public Health. To approve the performance monitoring system according to the strategic plan of the Faculty of Public Health.

Population

Executive Faculty of Education, Faculties and Student in Faculty of Public Health. A total of 1,200 people (as of November 8, 2015)

Sample

349 students of the Faculty of Public Health, Brainstorming to develop a strategic plan includes the management of the Faculty of Public Health, 40 Faculty of Public Health, And The Plan Review Board consists of the Faculty Committee for Education and 17administrators of the Faculty of Education.

Research tools

Questionnaire for student happiness in learning. Interview form with the plan management. Group meeting record form. Brainstorming Recording Form The quality of tools study by checking from the experts, 5 members of the Faculty of Public Health for validity and suitability of tools.

Research Result

Part 1: Study of Planned Implementation Status

Strategic Plan Evaluation of the Faculty of Public Health Burapa university Classified by objectives of the Strategic Plan of the Faculty of Public Health. Burapha University (December 1, 2015) found that: The total number of indicators was 28. The indicator was not able to collect 3 indicators. The result showed 18 indicators passed level, and found that the results did not achieve 7 indicators. Total is 64.29%. By the goal of strategic plan found that: Goal 1: Passed 66.67%, Goal 2 passed 75% and Goal 3 passed 54.55%.

Part 2: Improving and Developing a Strategic Plan

The SWOT analysis and brainstorming of faculty members of the Faculty of Public Health For use in the drafting of the revised Strategic Plan. That is consistent with the current situation, And the new update strategic plan of Burapha University. The Faculty of Public Health has the following details:

Vision of the Faculty of Public Health"Intellectual Property Associate Network Going Global" Brainstorming meetings To determine the appropriateness of the strategy. In Action Plan Fiscal year 2016, passed the Executive Board of the Faculty of Public Health Tuesday, 27 October 2015. The observations and issues that should be resolved as follows:

Strategy 1: Improve the quality of graduates

Strategies 1.1 Developing a process for selecting potential learners.

UPI 1.1-2 and 1.1-3 should define new indicators.

Strategy 1.2 Develop curriculum with the needs of the society.

UPI 1.2-1 should define new indicators.

UPI 1.2-3. Indicators 100% of courses that have been implemented need to be managed.

Cancel strategy 1.3 because no cooperative education.

Strategy 1.4, No. 10, One Project Indicator per Project per year, has a project to promote communication skills and social skills for the future.

Strategy 2: Development of Quality of Research and Academic Services

Strategy 2.1 Promote and drive research and academic service. Research Assistant for Publication / Publication

UPI 2.1-4 The plan should change the name of the project. Indicator 1) Out put to write the project. 2) There are proposals for the research project to put out the patent (Out put)

UPI 2.1-5 The plan should be adapted to the purpose of establishing two chemical / biological laboratories and administering laboratory standard indicators. And cut other purposes.

UPI 2.1-4 Number of Research Projects Use the community as a model for health research.

UPI 2.1-5 Number of Research Centers: 1 Labor Center, and 1 Elderly Center

Strategy 3: Development of human resources

Strategy 3.1 Promote and drive the development of human resources Development of academic position of faculty

UPI 3.1-8 Development of knowledge and skills. Technical support. Indicators 80% of personnel attended the training. Other details remain the same.

UPI 3.1-2 Access to Academic Position Professors 33.4% of the graduates attend training courses for the professor. Other details remain the same. Developing teaching potential

UPI 3.1-4 Ethics Promotion Objectives: To provide ethical support to the personnel. Indicators 80% of participants.

Strategy 3.3 Creates a system for recruiting, maintaining, deploying and developing systems and mechanisms for human resource management. UPI 3.3-5 Database creation and development

Strategy 3.4 Promote the development of foreign language skills.

UPI 3.4-1 English has standard English.

UPI 3.3-5 An information technology is the standard.
Strategy 4: Participation and Corporate Social Responsibility

Strategy 4.1: University Development to Green University

4.1.2 Percentage of quality water resources in the university.

- Water quality monitoring project : BOD, pH

4.1.3 Number of sections that develop facilities to promote walking and cycling.

4.1.4 The number of segments using energy saving lamps:LED

4.1.5 Number of segments with Applied Principles of University Design

- Improvement project / bathroom construction and ramp with Applied Principles of University Design

Strategy 4.2 Promotion of Research or Academic Service

4.2.1 Number of segments with target community Improve the budget allocation guidelines.

4.2.3 Number of segments after completion. Write a project to develop integrated relationship activities.

4.2.4 Number of projects to develop integrated activities.

- Open House Project of all branches / courses

Strategy 4.3 Promoting activities for the preservation of arts, culture, religion and sport. 4.3.1 The number of sections with art, culture, religion, sports, as well as goals for promoting improvement

4.3.3 The number of sections that the plan has done.

4.3.4 Number of projects: Arts, Culture, Religion, Sports.

4.3.6 Number of projects published

Strategy 4.4 Promoting Concepts in Sufficiency Economy and Creative Economy

4.4.1 The number of jobs that bring sufficiency economy and creative economy into the curriculum or way of working.

Strategy 5: Development of internal management efficiency

5.1-1 Evaluate developer TQA. Indicators: Number of the assessor: 5 assessor every year.

5.1-2 Basic training TQA Indicators: Number of trained managers with 100%

5.1-3 Create mechanism. Indicators: Number of appointments Number of activities performed PDCA

5.1-4 Plan: Indicator : Number of Plan

5.1-5 Internal assessor. Indicators : Self-Assessment time.

5.1-6 KM Indicates: Number of activities in KM.

5.1-7 Level of achievement. Indicators: Number of plans Number of planned activities

Part 3 Assessing the suitability of the strategic plan

3.1 Assessing the suitability of the strategic plan.

Relevance and consistency of opinions. Classified by the issues of the strategic plan found that: The introduce of the plan was at the highest level and the opinions were consistent (IQR <1.5). The highest Mdn. And Mission 4: Engaging and Responsible

for Society (Mdn. = 4.48) and found that: The lowest Mdn. Network partners move to the international (Mdn. = 4.20).

3.2 Assessing the suitability of the indicator strategy

The suitability of the indicator strategy: Relevance and consistency of opinions. Classified by strategy, The strategies and indicators were consistent (IQR <1.5). The 17 strategic strategies were appropriate. Most every strategy is 100 percent A total of 52 indicators were found to be suitable for the high level of 15 indicators, 28.85%. The highest number of 37 indicators was 71.15%

3.3 Feasibility, Benefit, Accuracy, Suitability Target Value (Criteria) Annual Criteria and consistency of opinion by the indicator of the strategic plan of the Faculty of Public Health.

Find that: The target value (the total criterion) of all indicators were consistent (IQR <1.5). The 52 indicators were the most appropriate. The most of the 30 indicators were 57.69%. The most of 22 indicators were 42.31%.

Conclusion

The result found that: The research summarized assessment strategic plan KPI by 64.29 per cent, KPI by goal were found that, Goal 1: 66.67 percentage pass, goal 2: 75 percent pass and goal 3: the strategic plan KPI pass by 54.55 percent. The new strategic plan found that, Strategy 1: improving the quality of graduates with 5 strategies. Strategy 2: Improving Quality of Research and Outreach with 3 Strategies. Strategy 3: potential development of personnel with 4 strategies. Strategy 4: participation and social responsibility with 4 strategies. Strategy 5: the development of effective internal management strategy is 1 strategy. The evaluate result of new strategic plan found that, All strategies are suitable for Very good level (100 percent), by 52 indicators found that: the good level of 15 indicators (28.85 percent). The Most of 37 indicators (71.15 per cent) are Very good level.

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The Impact of Students Dropout of School in Sokoto State: A Challenge to Human Security

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Abstract

This paper viewed school dropout as discontinuations of educational programme by a child or students. Education is the most important instrument for national development. Every nation irrespective of its economic growth as developed, developing, and underdeveloped engineers her educational programmes towards the provision of mass literacy for the production of quality manpower for human resources and economic growth for national development. This research is descriptive co relational type. The study was limited to school dropout within the Sokoto metropolis. A total number of 300 participants were selected through random sampling techniques. Two research questions were rose and answered. One instrument was used to collect the data, the questionnaire titled Students Drop out of School Questionnaire (SDSQ). The findings of the study revealed that students drop out of school has negative impact on human security. Therefore this paper recommended that government should encourage mass literacy.

Keywords: students drop out, human security

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Introduction

In the global perspective, it is an incontestable fact that the progress of the nations is highly dependent on the education of their citizens (Latif,Choudhari, and Hammayun, 2015). This is because education is the most important instrument for national development. Every nation irrespective of its economic growth as developed, developing, and underdeveloped engineers her educational programmes towards the provision of mass literacy for the production of quality manpower for human resources and economic growth for national development. Thus, the nations provide financial resources for the development of human resources that will transform the economy of the country for betterment. The realization of this made Nigeria to promulgate Universal Basic Education (UBE) programme in 1999 to ensure that every child is enrolled in schools. However, one of the objectives of this programme is to inculcate permanent literacy and numeracy in the Nigerian child to achieve the Millennium Development Goals.

The product of these institutions will then be enrolled in tertiary institutions. All this is done to provide adequate literacy for the citizens and aid in promoting human and materials resources for human and national security example raping, kidnapping cultism killing among others. However, dropping out of the school hampers human development which in turns led to human insecurity. The paper discusses the concept of human security, school dropout, theoretical framework, and review of some related studies. It stated the method of data analysis, data presentation and analysis, and finalize with the findings of the study as well as the uniqueness of the study.

Conceptual Frameworks

This section explains the concepts of human security (personal and security lively hood) and students drop out.

Human Security

There are different views about Human security (Alkire, 2003).But, the most important thing about the concept is that *human being* is central. This is because he is the one to be protected. The Commission on Human Security (CHS 2003) in its final report, Human Security Now, defines human security as the ability to protect the vital core of all human lives in ways that enhance human freedoms and human fulfilment. Human security means protecting fundamental human freedoms– freedoms that are the essence of life. It means protecting people from critical (severe) and pervasive (widespread) threats and situations. It means using processes that build on people's strengths and aspirations. It entails creating "political, social, environmental, economic, military and cultural systems that together give people the building blocks of survival, livelihood and dignity" (CHS, 2003 p. 4).

The two key components of the above conception are: protection from bodily harm and means of lively hood. Protection has been defined by the CHS (2003) as the "strategies, set up by states, international agencies, Non-Governmental Organizations" (NGOs) and the private sector, [to] shield people from menaces". It refers to the norms, processes, and institutions required to protecting people from critical and pervasive threats. This protection will provide individuals with freedom from fear. Empowerment on other hand is defined by the CHS (2003 p.10) as "strategies [that] enable people to develop their resilience to difficult situations". These two components (protection and empowerment) are interdependent. Hence CHS stated that, "both are required in nearly all situations of human insecurity, though their form and balance will vary tremendously across circumstances" (CHS, 2003 p.10).

Alkire (2003) stated that the main feature of human security is that it brings together the "human elements" of security, rights, and development. That is why it is an interdisciplinary concept that displays the following characteristics:

- (i) people-centered
- (ii) multi-sectoral
- (iii)comprehensive
- (iv)context-specific
- (v) prevention-oriented
- (i) **People-centered:** the concept of human security considers individuals as the 'centre of analysis' (Alkire, 2003). Therefore, it identifies those factors that pose threats to human wants and provide solution to them.
- (ii) Human security is also based on a **multi-sectoral** understanding of insecurities (Alkire, 2003). This component of human security entails causes of insecurity relating to economic, food, health, environmental, personal, community and political security.
- (iii)**Comprehensive** approaches entails the need for cooperative and multisectoral responses to security threats that bind the agendas of those dealing with security, development and human rights (Alkire, 2003)..
- (iv)The **context-specific** concept of human security acknowledges the insecurities vary considerably across different settings and as such advances contextualized solutions that are responsive to the particular situations they seek to address (Alkire, 2003).
- (v) Finally, in addressing risks and root causes of insecurities, human security is **prevention-oriented** and introduces a dual focus on protection and empowerment (Alkire, 2003).

Students Dropout of Schools

According to Latif (2015) dropping out of the school is defined by National Center for Education Statistics as leaving school without completing a high school education This definition indicated that absconding of the program of the school by the students is called school dropout. For this conception, Latif, (2015) concludes that students drop out means discontinuing schooling either for financial reasons and disappointment with their social system and examination results.

Saleh (2015) sees dropping out of high school as leaving high school without completion to a formal qualification awarded. This indicates the abandonment of an

education before the expected minimum number of courses has been completed. The potential dropouts are those students that are likely to totally abandon their studies. In essence, dropping out refers to the students quitting school programs before they graduates. Latif (2015) states that students' dropout their schools to fulfil their financial needs. Another reason of students' dropouts is that some parents are not interested in education for their children. Dropout rate in Bangladesh is also high as in other developing countries.

This paper considers students drop out to be a phenomenon that threatened individual human security. Depending on the individuals' social maladjustment, risk factors are events or conditions that increase the likelihood of an individual's experiencing emotional or behavioral problems that may contribute to dropping out. Others include: higher mortality rate; increased social dependence; lack of, or decreased, self-confidence or self-esteem; lost earnings; increased unemployment and social security benefits, and related costs.

Theoretical Framework

This paper was adapted from the "Life Chance Theory." The theory was developed by the German Sociologist, Max Weber to describe the opportunities each individual has to improve his quality of life this can only be achieve when individual are secured. It is a probabilistic theory that predicts how an individuals' life will turn out. The theory has it that the available resources that an individual has, determines whether his life can improve or remains at the position socioeconomically. He lists "properties ownership, Education, health care, food, clothing and shelter are the main factors that determine an individuals' life chance." Educationally, the theory implies that once an individual stay in school and acquire knowledge there is every possibility of improving his life chances and vice versa.

Review of Relevant Studies

There are various studies conducted on the impacts of students dropping out of schools on the sustainability of the society. Latif, Choudhari, &Hammayun (2015) conducted a comparative research on the Economic effects of students drop out of schools for the purpose of exploring the causes and the impacts of students drop out on the economic enterprises of the Pakistan Students. It was found that students Pakistan like any other student elsewhere in the world drop out of the school due to the following reasons: financial problems, parents' unwillingness, distance and lack of basic facilities, bad quality education, inadequate school environment and building, overloaded classrooms, improper language of teaching, carelessness of teachers, and security problems in girls' schools. The effect of drop out was found to bedevil the economy and human freedoms from fear and wants created.

Yumiko, (1997) Investigated the causes, processes, and consequences of the student's dropout from junior secondary school in Komeda-Edina-Eguofa-Abrem (K.E.E.A),Ghana. The researcher carried out the research on two levels- micro and Macro. At the macro level, he surveyed 39 schools in the district. He then took up the

micro investigation and surveyed 4 schools and undertook an in-depth study on then. He sampled 32 drop out and 32 stay-in students as the subject sample of his study. He found that there were financial, gender and social cause of drop-outs of students in the Ghana. Having compared the samples, he discovered that most drop-outs engaged in apprenticeship to lead to self-employment. Yet, these apprenticeship skills are gender sensitive. There are limited opportunities for women to be successful.

Statement of the Problems

Dropping out, with its many implications, remains a common term to use in describing the failure of schools and their students. Studies suggest that there is need for research in the area of student dropout to study how does it affects the social, economic, and security conditions of a country.

A study on United State of America (USA) identified that many student dropout their school because students found their classes boring, absence from school for long time and unable to manage their work, consuming time with those who are not interested in study, unnecessary freedom to do everything and failure in class were the main reasons for which student left their school during their education (Agbenyega and Klibthong, 2013). The consequence of this is that United State of America lost about \$292,000 for this threat (en.wikipedia.org). This huge amount of money affects other sectors of social development in which human empowerment for human security is included.

In developing countries like Nigeria, dropout rates are remarkably high. Saleh (2015), states that the high school dropout problem is a crisis because it impacts not only individuals and their education, but because of the economic and social costs local communities have to deal with. Communities suffer from a lack of productive workers and higher costs associated with incarceration, health care, and other social services. She confirmed that most of the young dropouts experience a wide range of job market, earnings, social and income problems that impair their ability to transition to productive career and stable family life. Thus, their life chance had been threatened.

It is disheartening that experience shows that in Sokoto state students were found to be falling apart in tertiary institutions. They are found to be dropping out of the schools. This paper therefore undertakes to assess the gravity of the tertiary students drop out in Sokoto state and examines how it affects human security in the state. The paper argued that tertiary students drop out in can cause human insecurity which advertently affect state security and national development.

Research Questions

Q1. How does student's dropout in tertiary educational institutions in Sokoto State affect the personnel security?

Q2. How does student's dropout in tertiary educational institutions in Sokoto State affect the security of people lively hood?

Objectives of the Study

The objectives of this study are to assess the extent of the students drop out in institutions in Sokoto State and how it affects human security. The study is designed to achieve the following objectives:

- i. Find out the relationship between students dropout in tertiary educational institutions and personal security in sokoto state.
- ii. Find out the relationship between students dropout in tertiary educational institutions and security of people lively hood in sokoto state.

Research Methodology

The research is a descriptive survey of co relational type. The study was limited to school dropout in tertiary educational institutions within the Sokoto metropolis. A total number of 300 participants were selected from Shehu Shagari College of Education, Sokoto (SSCOE), Sokoto State University and Sokoto State Polytechnic Sokoto, through random sampling techniques. Two research questions were rose and answered. One instrument was used to collect the data, the questionnaire titled Students Dropout and Human Security Questionnaire (SDHSQ). The instrument was validated by team of expert in Educational Management. The reliability of the instrument was obtained using test and re-test methods and a co-efficient of 0.75 was obtained. The researcher and trained field assistance were personally administered the questionnaire to all respondents. The responses to the questionnaire were be collected and processed with the use of Statistical Package for Social Science (SPSS). The statistical tool to be use in analyzing the data obtained is simple percentages and Person Product Moment Correlation Co-efficient (PPMCC).

Research Question 1:

How does student's dropout in tertiary educational institutions in Sokoto State affect the personnel security?

Table 1: Effect of Student Dropout and Personal Security										
S/N Item Students	Agree	Disagree								
1. Dropouts contribute in political attacks	85%	25%								
2. Dropouts contribute in kidnapping citizens	65%	35%								
3. Dropouts contribute in rape cases	70%	30%								
4. Dropouts contribute in rituals killings	45%	65%								
5. Dropouts contribute in armed bandits attacks	64%	36%								

This research question was answered and present in table 1

Item 1 in Table 1 shows that, the majority of participants 85% agreed that dropout of tertiary education institutions contribute in political attacks on citizens. Item 2 shows that, the majority of the participants 65% agreed that dropout contribute in kidnapping the citizens. Item 3 shows that the majority of the participants 70% agreed that, dropout contribute in rape cases. Item 4 shows that, the majority of the participants 65% disagreed that, dropout contribute in ritual killing. Item 5 shows that, the majority of the participants 64% agreed that, dropout contribute in armed bandits attack.

Research Question 2:

How does student's dropout in tertiary educational institutions in Sokoto State affect the security of people lively hood?

This research question was answered and present in table 2

Table 2		
S/N Item Students	Agree	Disagree
1. Dropouts are employable for industrial security	30%	70%
2. Dropouts are interested in farming for food security	20%	80%
3. Dropouts are contribute in commercial activities	55%	45%
4. Dropouts are do contribute self-employment	52%	48%
5. Dropouts are do contribute as un-skills labourers	26%	74%

Table 2

Item 1 in Table 2 shows that, the majority of participants 70% disagreed that, dropouts of tertiary educational institutions are employable for industrial security. Item 2 shows that, the majority of the participants 80% disagreed that dropout are interested in farming for food security. Item 3 shows that the majority of the participants 55% agreed that, dropout contribute in commercial activities. Item 4 shows that, the majority of the participants 52% agreed that, dropout do contribute in self-employment. Item 5 shows that, the majority of the participants 74% disagreed that, dropout do contribute as un-skill labourers.

Summary of Findings

- 1. Students dropout from tertiary educational institutions contribute to personal insecurity in Sokoto State.
- 2. Students droping out of schools contribute to insecurity of liveli-hood in Sokoto State.

Discussion of Findings

The result of this study found that there is relationship between students' dropout and personal security in Sokoto State. Therefore this affects security of lively-hood and increase fear and want among the teeming population which the State Government believed to be fighting against. There findings from this paper agrees with Latif, Choudhary, and Hammayun, (2015) that dropping out of school by students affect the

economy society for the simple reason that the work force is going to be diminished. Thus human security has been affected. However, the findings went contrary to the Yuniko (1997) who found that students in Ghana turn to apprenticeship and microenterprises-for self-employment.

Conclusion

The paper concludes that education is prerequisite in the empowerment of the human beings. It provides to them not only the knowledge but also the skills that will relieve him with fears of human existence and adaptation with situations. The human beings can use their knowledge obtained in schools to initiate, invent, and innovate new things that can make them to self-subsistence and self-employed apart from working under any organization. These empowerment opportunities provided by schools will only benefit those that were retained in schools. Schools can therefore be a catalyst for providing human security.

Recommendations

The paper finally recommends the following:

- 1. Government should encourage entrepreneurship program and make it compulsory for school dropout.
- 2. The government should target schools as the centres for fighting human insecurity.

Suggestions for Further Studies

- 1. Research should be conducted on out of school children in North-West Nigeria.
- 2. There should be a research on mass-education (Adult education programme).

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Investigating the Needs of Library Members of Institute for the Intellectual Development of Children and Young Adults of Ahvaz City in Rendering Education for Non-Book/Electronic Material Services

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Abstract

Purpose: The children and young adults' libraries can play an effective role aside the formal educational system, especially when the school libraries are weak in a region. This study aims to investigate the need for educational programs for library members of institute for the intellectual development of children and young adults in Ahvaz regarding provision of non-book/electronic materials services. Method: This research is an analytical survey with an applied purpose. An organized questionnaire was used for collecting information. The results were presented using descriptive statistics. The research community consists of two groups of managers (7 people) and members of the libraries of the intellectual development center for children and adolescents in Ahvaz (172 people). Results: The findings showed that 33.7% of the members go to the library twice a week and 54.07% of them use library for personal study. Among them, 30.81% were not satisfied with library resources. 6.65% of the members needed education to use online search services on the Internet, and 4.97% needed education for offline services. Conclusion: The results showed that there are not many non-book materials such as slides and films, as well as electronic services such as databases in the libraries of the intellectual development of children and young adults in Ahvaz. In some libraries it is possible to provide non-book materials and electronic services in terms of space and facilities. But other libraries do not have the facilities. Therefore the libraries aside the schools need to provide educational workshops for students of the schools and their members. Special emphasis must be placed on the planning for these services for children libraries

Keywords: Intellectual Development of Children and Young Adults Institute, Ahvaz – children libraries, Non-book materials/ electronic services

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Introduction

In the past, libraries were only considered as places for keeping books and librarians as keepers of books. Over time, with the sophistication of knowledge and its communication tools, the process of knowledge transfer has become increasingly important. So, this has become a major concern of the experts of information science and librarians to identify and disseminate appropriate information.

One of the most desirable methods for accessing information is using non-book materials and services in libraries (Bagheri, 2006). Non-book sources are a major part of library services. These sources are very effective in formal and non- formal education and can provide users with invaluable real experiences (Azadeh et al., 2010). Their Abundant productions, ease of access and lower costs compared to printed sources have made these resources very popular among users. The electronic resources have become an integral part of all libraries and the libraries are trying to access these resources more and more (Bagheri, 2006).

Both domestic and international studies conducted in this area demonstrate the key role of the non-book materials and services. Sohrabzadeh et al. (2015) in their research entitled "the perception of children aged 7-14 from the user interface of the Iranian Children's National Library" showed that these children have different levels of perception of the user interface of the Iranian Children's National Library. They concluded that the home page of the National Library website should be designed in a way to provide children of different age groups with easy access to the available sources.



National Library of Iran Digital Library for Children



National Library of Iran- digital library for Children -user interface with icons for age groups and kinds of literature.

Khodami et al. (2014) in their research entitled "the feasibility of providing electronic reference services in the public libraries of Tehran city" found that the major problems in the establishment of electronic reference services in public libraries affiliated with the Iran Public Libraries Foundation include: lack of necessary IT equipment, facilities and infrastructures, lack of adequate budget, lack of specialized staff and finally, librarians' unwillingness to provide electronic reference services.

Ehsani (2009), in a research entitled "comparing the reading preferences of the guidance school students ("D" age group) in Ahwaz with the books available at the Central Library of the Institute for the Intellectual Development of Children and Young Adults during 1996-2006. She concluded that in many sub-categories, there was no correlation between the students' reading preferences and the frequency of books available at the central library. This was more evident in topics such as ancient literature: realism (novel); fantasy; poetry; social sciences; experimental sciences; biographies; art, games and entertainment and reference books.

Kaur and Verma (2009) investigated the use and impact of electronic journals in the Indian Institute of Technology in Delhi. Their results showed that the usage of e-journals was growing increasingly and this was due to the increasing awareness of users about library services and resources and ease of access to these resources at various locations (24-hour access at the college, at the library, department and computer center).

In 2006, Cavazos conducted a study on the reading interests of talented middle school boys. He showed that teachers have conducted special educational programs, through which they have had a huge impact on increasing the reading preferences of these boys and consequently, their overall reading time. He also pointed out that talented

and gifted teenagers generally visit large libraries and bookstores to meet their study needs. They also select their favorite books very carefully (Cavazos, 2006).

Bagheri (2006), in her master's thesis entitled "investigating the application of nonbook materials available at the academic libraries of the Islamic Azad University" showed that 56% of these libraries had non-book materials and most of the materials were used for research and teaching purposes.

Hopper (2005) conducted a research entitled "What are teenagers reading? Adolescent fiction reading habits and reading choices". He examined 707 school students aged between 11 and 15 in the south-west of England and concluded that the personal experiences of the subjects as well as their educational qualifications affect their reading attitudes and ultimately leads to better choices.

Considering the significant educational role of non-book materials and services in providing recent educational resources for the future generations, these materials and services must be provided for the members of the libraries of the Iranian Institute for the Intellectual Development of Children and Young Adults. Therefore, this study investigated the needs of the members of the libraries of the Iranian Institute for the Intellectual Development of Children and Young Adults of Ahvaz in provision of non-book materials and services. In this regard, first the needs of the users of these libraries for non-book materials and services were assessed. Then the capacity of the libraries in providing these materials and services was evaluated and finally, appropriate solutions and strategies were offered to provide the materials and services.

Research questions:

- 1. How is the current status of the staff, members and libraries of the Iranian Institute for the Intellectual Development of Children and Young Adults of Ahvaz?
- 2. Do the relevant bodies have adequate funds to provide non-book materials and services in these libraries?
- 3. Is there enough space in these libraries for establishment of non-book materials?
- 4. How well are these libraries equipped with tools, methods, equipment and facilities for providing non-book materials and services?
- 5. How well are these libraries supplied with the required resources?
- 6. What are the purposes and motives of the members from visiting the library?
- 7. Which form of non-book service resources meets the most information needs of the members?
- 8. Do the librarians of these libraries have the adequate knowledge to use nonbook materials and services and offer them to the visitors?
- 9. What types of trainings are provided by the librarian to familiarize members with non-book sources?
- 10. What are the main problems of the members regarding their access to their information needs?

Methodology

This was an applied-analytical survey. The number of libraries of the Iranian Institute for the Intellectual Development of Children and Young Adults of Ahvaz was 7 and

all the libraries were studied. These libraries had 8118 members. The normal sampling method was used (Aria-Nejad, 1995) and its formula is presented below. In this formula, a sample of 30 or more individuals was considered for each age group. Finally the sample size was determined as 200 and a total of 172 questionnaires were collected from the participants.

$$n = \left(\frac{Z\frac{a}{2}\delta}{e}\right)^{-2}$$

Two questionnaires were used to collect data. The first questionnaire was designed to be completed by the authorities of the libraries. It included 22 questions and consisted of two parts. The first part (questions 1-7) was associated with the demographic information of the authorities. The second part (questions 8-22) assessed the status of the libraries in terms of the number of librarians, their educational qualifications, different parts of the libraries, the number of Persian and Latin books, the frequency of using non-book materials and services, the status of spaces and facilities and allocated budget. The second questionnaire was designed to be completed by the members of the libraries and included 19 questions. This questionnaire included questions about the demographic information of the users, their educational qualifications, their enthusiasm and their purpose of visiting the library, their level of satisfaction with the resources and their need for non-book materials and services. The face validity of the questionnaire was measured by experts. The reliability of the questionnaire was performed using SPSS version 18 software.

Results & Discussion

After distributing 200 questionnaires, a total of 172 questionnaires (86%) were collected. According to the results, 54.65% of the participants were female and 45.35% of them were male.

The authorities of the studied libraries were all female (100%), among which 71% aged 30-40 years and had bachelor degrees. All the authorities have non-library degrees (Table 1). Evidence showed that all the librarians undergo ICDL training courses, at the beginning of their recruitment. They can learn the basics of computer and this helps them using many non-book materials.

Variables		No.	%
Condor	Female	7	100
Genuer	Male	0	0
A go group	30-40	5	71
Age group	41-50	2	29
A and amin doman	Bachelor degree	5	71
Academic degree	Master degree	2	29
Field of Study	Librarianship degree	0	0
rielu ol Study	Non-library degree	7	100

Table 1: The demographic characteristics of the authorities of the studied libraries

The results of the first question showed that the libraries of the Iranian Institute for the Intellectual Development of Children and Young Adults of Ahvaz were in relatively poor condition in terms of the status of their non-book materials (Table 2). The results are consistent with the study of Majidi (2008). He also concluded that the public libraries of Ahvaz do not offer non-book materials such as slides, videos, filmstrips, microforms, cassette tapes, discs, CDs, VCDs and electronic services like the internet; and other sources such as atlases and maps are used very rarely. The results of this question are not consistent with the results of the study of Kaur and Verma (2009).

Findings of the second question showed that the Iranian Institute for the Intellectual Development of Children and Young Adults of Ahvaz did not provide sufficient funds to their libraries on a regular basis. The results of this question are consistent with the results of the studies of Khodami et al. (2014) and Tavakoli (2001). Tavakoli argued that lack of visual-auditory equipment in the central libraries of public Iranian universities is a major problem and the main reason is inadequate budget allocated to these libraries.

		The f	requency	y distribu	tion of n	on-book i	material	s in librar	ies		
Materials	Very	[,] high	Н	ligh	Meo	liocre	L	OW	Very	y low	Total
	%	Freque ncy	%	Frequ ency	%	Frequ ency	%	Frequ ency	%	Frequ ency	
Video	0	0	0	0	2.6	2	3.9	3	2.6	2	7
Filmstrips	1.3	1	0	0	0	0	0	0	7.79	6	7
Microforms	0	0	0	0	0	0	0	0	9.09	7	7
Microfiche	0	0	0	0	0	0	0	0	9.09	7	7
Cassette tapes	0	0	0	0	0	0	3.9	3	5.18	4	7
Discs	0	0	0	0	1.3	1	0	0	7.79	6	7
CDs	0	0	0	0	2.6	2	2.6	2	3.9	3	7
VCDs	0	0	0	0	0	0	0	0	9.09	7	7
Slides	0	0	0	0	0	0	0	0	9.09	7	7
Sources recorded on CD	0	0	0	0	0	0	2.6	2	6.49	5	7
Non-printed materials	0	0	0	0	1.3	1	1.3	1	6.49	5	7
Total	1.3	1	0	0	7.8	6	14.3	11	76.6	59	77

Table2: the frequency of non-book materials in the libraries

The results of the third question showed that most of the libraries of the Iranian Institute for the Intellectual Development of Children and Young Adults of Ahvaz did not have enough space for establishment and provision of non-book materials and services. Majidi (2008) also concluded that only few of the public libraries of Ahvaz have suitable space for establishment of non-book materials and services. The results of this question are in line with the results of Majidi.

Regarding the fourth question, according to the Table 3, only 14% of the libraries of the Iranian Institute for the Intellectual Development of Children and Young Adults of Ahvaz were well equipped with tools, methods, equipment and facilities for providing non-book materials and services. Tavakoli (2001) obtained similar results and argued that lack of visual-auditory equipment in the central libraries of public Iranian universities is a major problem. These results are consistent with the results obtained in this question.

Table 3: The frequency distribution of the equipment and facilities available in the studied libraries for utilizing non-book resources

Statistical indicators	The freque facilities a non-book	The frequency distribution of the equipment and facilities available in the studied libraries for utilizing non-book resources										
	Very low	Low	Mediocre	High	Very high							
Frequency	3	1	2	1	0	7						
Percentage	43	14	29	14	0	100						

Regarding the fifth question, as Table 4 shows only a small percentage (about 7%) of the libraries of the Iranian Institute for the Intellectual Development of Children and Young Adults of Ahvaz were well supplied with the required resources. In their study, in the Indian Institute of Technology, Kaur and Verma (2009) concluded that library visitors were significantly satisfied with the available resources, which is not consistent with the results of the present question.

 Table 4: The frequency distribution of the respondents in terms of their satisfaction with the resources available at the studied libraries

Statistical	Satisfact	Satisfaction with the library resources									
indicators	Very	Low	w Mediocre		Very	No	Total				
	low	Low	iviteuroer e	11151	high	response					
Frequency	45	53	44	17	12	1	172				
Percentage	26.16	530.81	25.58	9.89	6.98	0.58	100				

Regarding the sixth question, as Figure 1 shows a high percentage of the visitors had visited the libraries for personal interest and to study new sources.



Figure1: purpose of members by visiting Library

Regarding the seventh question, based on the Table 5 and Table 6, CDs, VCDs and online and offline search services were the first priorities of the visitors of the libraries of the Iranian Institute for the Intellectual Development of Children and Young Adults of Ahvaz. A two-way ANOVA test was used to determine the relationship between research variables. Based on the results, there was a significant difference between the variables at the 1% significance level 0.000 (Table 5). The results of this question are in line with the results of Majidi (2008) who found that users of Ahwaz public libraries require non-books materials and services. However, he found that optical discs, videos and online and offline search services were the first priorities of the users.

					95% interval	confidence		
Items	No.	Mea n	SD	Erro r	Lower bound	Upper bound	Min	Max
Online search services	172	2.33	1.98 5	0.15 1	2.03	2.63	1	32
Offline search services	172	3.38	1.93 0	0.14 7	3.09	3.67	1	4
Sharing and utilizing databases and databasks	172	4.85	2.16 3	0.16 5	4.52	5.17	1	4
Borrowing videos, filmstrips and microforms	172	6.01	2.44 5	0.18 6	5.64	6.38	1	4
Borrowing Discs and CDs	172	4.40	1.85 0	0.14 1	4.12	4.67	1	5
Borrowing VCDs	172	4.79	2.09 5	0.16 0	4.48	5.11	1	5
Borrowing slides	171	7.49	1.81 9	0.13 9	7.21	7.76	1	5
Borrowing e-resources recorded on CD	172	5.42	2.48 7	0.19 0	5.04	5.79	1	5
Utilizing printed non- book materials such as maps, atlases, etc.	172	6.35	2.25 7	0.17 2	6.01	6.69	1	5
Total	1547	5.00	2.57 9	0.06 6	4.87	5.13	1	32

Table 5: Two-way ANOVA test conducted to determine the necessity of providing

	Cumulative frequency	R	SST	Frequency	Sig.
Intergroup variance	3323.944	8	415.493	91.814	0.000
Intergroup variance	6960.056	1538	4.525		
Total	10284.000	1546			

Table 6: Two-way ANOVA test conducted to determine the necessity of providing non-book services to meet the information needs

Based on the results of Table 7, the findings of the eighth question showed that most of the librarians had an average and basic knowledge in terms of using non-book materials and services. Tavakoli (2001) achieved similar results in his research. He found that in the central libraries of public Iranian universities, lack of expert human resources and lack of visual-auditory equipment were the most important problems. These results are also consistent with the results of Khodami et al. (2014).

Table 7: The frequency distribution of the respondents regarding the librarians' knowledge of non-book materials

Statistical	The l materia	Total				
indicators	Very low	Low	Mediocre	High	Very high	Totai
Frequency	11	4.9	63	37	12	172
Percentage	6.4	28.5	36.6	21.5	7	100

Regarding the ninth question, the results of Table 8 showed that the librarians did not provide appropriate training to the members about the non-book materials. Majidi (2008) also found that the public libraries of Ahwaz offer no training to their members on using these materials. This is consistent with the results of the study of Majidi.

 Table 8: The frequency distribution of the respondents regarding the provision of trainings by the librarians

Statistical	The lev	ibrarians				
indicators	Very low Low		Mediocre	High	Very high	Total
Frequency	52	25	49	37	9	172
Percentage	30.2	14.5	28.5	21.5	5.2	100

The results of the tenth question indicated that the most important problems raised by the respondents regarding their access to their information needs included problems associated with finding information, lack of adequate non-book materials and lack of adequate time for searching information, respectively. In addition, lack of proper service provision by librarians was among the least important problems (Table 9).

	E.L.			-	E line	L a L	P	and he	El.		100	01.	E	with a	10.0		8		
	Fir	st	N	0	Eig	nth	Seve	enth	SD	cem	FU	rth	Fou	rth	Th	ird	Sec	ond	
	prio	rity	resp	onse	prio	rity	prio	rity	prio	rity	prio	rity	prio	rity	prio	rity	prio	rity	Tota
Problems associated with	F%	F	F%	F	F%	F	F%	F	F%	F	F%	F	F%	F	- F%	F	F%	F	1
finding information																			
Lack of adequate non-book	0	0	0.0	1	0.2	3	0.00	0	0.29	4	0.36	5	0.87	12	1.23	17	9.45	13	172
materials			0		2													0	
Lack of adequate time for	0.0	1	0.2	3	0.7	10	1.23	17	1.60	22	2.03	28	2.25	31	3.92	54	0.44	6	172
searching information	7		2		3														
Limited working hours of	0.0	1	0.2	4	0.6	9	1.45	20	1.89	26	1.74	24	3.05	42	2.54	35	0.80	- 11	172
libraries	7		9		5														
Inappropriate behaviors of	0.7	10	7.2	10	1.2	17	0.94	13	0.72	10	0.87	12	0.29	4	0.29	4	0.14	2	172
librarians	7		8	0	3														
Lack of awareness of the above	0.2	4	0.5	7	1.0	14	1.23	17	1.67	23	3.34	46	2.25	31	1.74	24	0.44	6	172
resources	9		1		2														
Lack of proper service	0.7	10	073	10	4.6	64	2.25	31	1.23	17	1.09	15	1.09	15	0.58	8	0.14	2	172
provision by librarians	3				5														
Lack of familiarity with library	0.2	3	0.2	3	1.6	23	1.89	26	2.69	37	1.67	23	2.03	28	1.23	17	0.87	12	172
software	1		1		7														
Physical problems of library	0.3	5	2.3	33	1.8	26	3.19	-44	1.96	27	0.94	13	0.65	- 9	0.87	12	0.20	3	172
building (lighting, ventilation	6		9		9														
etc.)																			
Total		17		17		17		17		17		17		17		17		17	1376
		2		2		2		2		2		2		2		2		2	

Table 9: The frequency distribution of the respondents regarding the problems restricting access to information needs

F is: Frequency & F% is: Percentage of frequency

The results showed that the 7 studied libraries had significant differences in terms of space, the number of visitors and the number of available books. The results of the first questionnaire represented the capacities of the libraries in terms of establishment of such materials and services. The results of the second questionnaire represented users' need to non-book materials and services.

Considering that the users of the libraries of the Iranian Institute for the Intellectual Development of Children and Young Adults of Ahvaz are children and adolescents, non-books materials, especially optical discs or Internet services, can positively affect their educational achievements.

Findings show that new sources are not provided on a regular basis, and, given the limited space available at these libraries, it is impossible to collect all the resources needed for all users. Therefore, non-book materials and services, such as compact discs and other electronic resources that contain information in a compact form (e.g. online and offline Internet search services) can meet these expectations to some extent.

Based on the results, some of the studied libraries were rich in terms of resources to some extent. In addition, users supported the establishment of non-book materials and services in libraries and found them highly effective in their academic achievements. The results showed that some of the libraries of the Iranian Institute for the Intellectual Development of Children and Young Adults of Ahvaz of were in an acceptable condition in terms of the number of books. However, many libraries lacked appropriate books, Latin books and new books, especially in sciences such as computer sciences that are constantly evolving.

Computers were used for searching information in the libraries and all the librarians were able to work with computers.

Considering the educational status of the users of the studied libraries and their views on the use of non-book materials and services, it can be concluded that they are in grave need of establishment for such services.

Conclusion

The results showed that there were not many non-book materials such as slides, videos as well as e-services such as the databases via Internet in the libraries of the Iranian Institute for the Intellectual Development of Children and Young Adults of Ahvaz. Some libraries had desirable conditions in terms of providing appropriate facilities, materials and training in the area of non-book services; however, other libraries did not possess needed potentials and facilities to provide such services. Therefore, it is necessary to organize educational programs and workshops for teaching members of these libraries to better utilize non-book/electronic sources.

In addition, all the managers of libraries of the Iranian Institute for the Intellectual Development of Children and Young Adults of Ahvaz are recommended to organize training courses for all librarians, especially for educated ones in order to teach them the use of non-book materials and services, especially online search services. This way, each library will have at least one specialized librarian who is fully familiar with these services and can help the members to use these services.

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Clustering the Patterns of Program Cooperation Among Cross-Strait Universities

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Abstract

This study aims to evaluate the patterns of program cooperation among cross-strait universities for promoting mutual development in future. The data were collected from current cross-strait university cooperation and exchange programs in the selected universities. Fifty-eight leading universities have been reviewed by using their numbers of ongoing cooperation and exchange programs in their official web pages. The target group has been reviewed, which includes 31 universities in Taiwan and 27 universities in mainland China. This study transformed the data by applying mean, t-test, and cluster analysis for further interpretation. The result reveals the activities of cooperation are different among the universities by sectors and their locations. According to Euclidean distances in the cluster analysis, there are four significant clusters among the universities have been found. The different patterns of linkage among the universities provide more meaningful implications for university cooperation. Moreover, the SWOT analysis provides further information to interpret the strategy selection among the cross-strait universities to enhance their cooperation. Finally, this study proposes some suggestions for researchers to further expand the knowledge in this issue.

Keywords: cluster analysis, higher education, SWOT analysis, university cooperation

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Introduction

The relationships between China and Taiwan are changeable in the last decades. Political reasons and military tensions have impacted on the cross-strait interaction in culture and education activities. Cross-strait university cooperation has been initiated for a long period, while under the unique political issues the effect of proposed cooperation activities still unclear. Reviewing the current literature, this study also found it lacks of systematic studies in this field. Regarding the cross-strait contact and interactive experiences, this study explores the special phenomena among higher education institutions under political pressure. Basically, the cross-strait university cooperation is different from that of traditional notions of internationalization (Altbach and Knight, 2006; Altbach and de Wit, 2015; Jones and de Wit, 2012; Knight, 2015; Teichler, 2015). It is unequal to the format of internationalization at home (Beelen and Leask, 2011). Taking institutes to institutes models as examples, this study focuses on selected universities in mainland China and Taiwan to determine their effect of ongoing cross-strait cooperation.

Since 2009, the cross-strait business and culture cooperation activities are increasing. Korean media created a new word called "Chiwan" to address the new economic phenomena. Liu (2010) pointed that economic and educational interaction will initiate earlier than do other political related issues. Considered the unpredicted cross-strait relationships, Kuo (2009) argued the educational interaction in both areas will favor the mutual relationship and deepen the peace in that area. Actually, the Taiwan's authority has approved the mainland China's higher education accreditation lists in 2011. Following the lists of higher education institutes, Taiwanese students can enroll and graduate from those universities. Typically, the 41 accreditation listed universities in mainland China included 39 universities in 985 Project. The recognized lists have showed increased in 2011, the number of universities expanded from 41 to 111 which included the universities in 211 Project. In 2016, there are 155 universities in the new accreditation lists (Division of Higher education, MOE, 2016). Simultaneously, the Chinese students are welcome to study in Taiwan. This is a unique experience of cross-strait university cooperation under specific political reasons.

This study focuses on the universities cooperation and exchange activities by using the data collected from current cross-strait university interaction to answer the following research questions:

1. What is the current picture of cross-strait university cooperation and exchange?

2. Which factors are favored or disfavored in cross-strait university cooperation and exchange?

3. What's next step for cross-strait university cooperation and exchange?

Methods

Based on the cross-strait interactive activities in higher education institutes, this study collected the data from selected universities which include their locations, institutes ranking, sectors, and the numbers of MOU. The data were classified and interpreted by using t-test and cluster analysis respectively. In this study, the data collection is different from that of traditional questionnaire survey. Questionnaires represent one of the most practical cost effective methods to obtain large amounts of data, and produce

relatively robust evidence when adequate validation exercises are implemented. However, respondent bias remains an issue, especially regarding socially desirable responses (McDonald, 2008), which represents an inherent limitation of the method. By way of web data which the target universities have provided, this study transformed the data to fit the format of cluster analysis. Reviewing the method related literature, this study found previous studies have provided various examples for conducting cluster analysis (Battaglia, Paola & Fazio, 2016; Brusco, Singh, Cradit & Steinley, 2017; Crowe, LoPilato, Campbell, & Miller, 2015; Lankton, McKnight, & Tripp, 2017). In this study, the methodological section will follow the useful suggestions to determine the fittest classification for the current data.

Research target

Due to the time and resource constrain, this study selected 31 universities including research focusing, teaching oriented in terms of teaching excellence universities, and modeling technological universities in Taiwan. There are 27 leading universities in 985 Project were selected in mainland China, the other universities in 985 Project are omitted because of their data incomplete or not possible to search on web page at this time.

Statistics analysis

Cluster analysis is a popular statistical method. It is also called segmentation analysis or taxonomy analysis, partitions sample data into groups or clusters. Tryon (1939), the first time initiated the notion, indicated there are various algorithms and methods in cluster analysis. Clusters are formed such that objects in the same cluster are very similar, and objects in different clusters are very distinct. Basically, cluster evaluation determines the optimal number of clusters for the data using different evaluation criteria in diverse settings. In this study, the data selection was the first step; then we applied hierarchical clustering with SPSS to determine the clusters; the verified the clusters by using k-means clustering in SPSS.

Hierarchical Clustering

Typically, hierarchical clustering groups data over a variety of scales by creating a cluster tree or dendrogram. The tree is not a single set of clusters, but rather a multilevel hierarchy, where clusters at one level are joined as clusters at the next level. The dendrogram function plots the cluster tree. Based on the dendrogram, this study decides the level or scale of clustering that is most appropriate for the data application. The agglometrative methods in this study include single linkage, average, centroid and Ward. The single linkage method calculated the distances are as follows:

$$d_{A,B} = \underset{i \in B}{Min} d_{ij}$$

The average linkage method calculated the distances are as follows:

$$d_{A,B} = \Sigma \Sigma d_{ii} / n$$

n in terms of the numbers of distances;

The centroid method calculated distances are as the follows:

$$d_{A,B} = d(\overline{\overline{x}}_A, \overline{\overline{x}}_B) = || \overline{x}_A - \overline{x}_B ||^2$$

While the Ward method transformed the data according to the following format: $d_{A,B} = n_A || \overline{x}_A - \overline{\overline{x}} ||^2 + n_B || \overline{x}_B - \overline{\overline{x}} ||^2$

K-Means Clustering

K-means clustering is a partitioning method. The function *k*-means partitions data into k mutually exclusive clusters, and returns the index of the cluster to which it has assigned each observation. Unlike hierarchical clustering, *k*-means clustering operates on actual observations (rather than the larger set of dissimilarity measures), and creates a single level of clusters. The distinctions mean that *k*-means clustering is often more suitable than hierarchical clustering for large amounts of data. In this study, *k*-means treats each observation in the data set as an object having a location in space. It finds a partition in which objects within each cluster are as close to each other as possible, and as far from objects in other clusters as possible. In SPSS process, the *k*-means provides more meaningful statistical test information. Taken the advantage of this method, each cluster in the partition is defined by its member objects and by its centroid, or center. The centroid for each cluster is the point to which the sum of distances from all objects in that cluster is minimized. *K*-means computes cluster centroids differently for each distance measure, to minimize the sum with respect to the measure that we specify. Basic *k*-means algorithms are as follows:

- 1. Select *k* point as initial centroids,
- 2. Repeat
- 3. From *k* clusters by assigning each point to its closest centroids,
- 4. Re-compute the centroids of each cluster,
- 5. Until centroids do not change.

SWOT analysis

The effect of cross-strait cooperation has been evaluated by using SWOT model. First, the study listed the strong and weak conditions based on the collected data. Second, this study taken into account opportunities and threatens to develop improving strategies. Finally, the information was synthesized from SWOT to SWOTS in terms of using SWOT framework to find strength, opportunity, threat and weakness information in the field, after that this study created active, utilized, controlling, and improving strategies for suggestions.

Result

The result will present the current real pictures of cross-strait university interaction in the selected universities. First, this study reviewed the selected 10 leading universities from mainland China and Taiwan to compare their cooperation formats. Then, the cumulated university cooperation and exchange activities will be addressed. Finally, the favor or disfavor factors will be evaluated for enhancing the cross-strait university cooperative activities in future.

Selected 10 leading universities' cross-strait cooperation activities

Table 1 shows the political limited areas in terms of 8 provinces or cities in mainland China still create more cooperative opportunities for Taiwan's 5 leading universities compared to the other unlimited provinces or cities. Regarding the cooperation with cross-strait and world-wide universities, this study found the cross-strait cooperative activities are only a small part of the whole universities' cooperative activities. The proportions share of cross-strait cooperation among these universities are: NCKU 10.55%, NTU 10.78%, NCTU 15.23%, NTHU 19.33%, and TKU 17.59%.

Name of university	Туре	Research U.	Sector	Number of cooperation with universities in eight provinces or cities	Number of cooperation with universities not in the eight provinces or cities	Total number of cooperation with mainland China's university (A)	Total number of cooperation with world-wide universities (B)	A/B (%)
NCKU	1	1	1	19	6	25	237	10.55
NTU	1	1	1	41	21	62	575	10.78
NCTU	1	1	1	25	14	39	256	15.23
NTHU	1	1	1	28	24	52	269	19.33
TKU	2	0	0	22	13	35	199	17.59

Table 1	Current	universities	cooperation	with s	selected 5	leading	universiti	ies in
			Taiw	an				

Note: Type 1 represents the research funding universities, 2 represents the teaching excellence funding universities; Sector 1 represents the public universities, sector 0 represents the private universities;

The numbers of cooperation activities in selected 5 leading universities in mainland China with Taiwan's universities are different. There are only 6 Taiwan's universities cooperation with SJTU, while 25 Taiwan's universities have created cooperation with SYSU. Basically, PKU only 4.21% of her total cooperation programs with Taiwan's universities, while RUC has shown 34% of her cooperation programs with Taiwan's universities, see Table 2.

Table 2.	Universities	cooperation	with	selected	5	leading	univ	versities	in	mainland	
				~1 ·							

				Chi	na			
Area/city	Name of	Lo	cated	985	Recogni	Numbe	Number of	A/
	universit		in 8	proje	zed	r of	cooperation	В
	У		provi	ct	by	coopera	with	(%)
			nces		Taiwa	tion	world-wide	
			and		n	with	universities	
			cities			Taiwan	(B)	
						(A)		
Peking	RUC	1	1	1	17	50	34.00	
Peking	PKU	1	1	1	16	38	0 4.21	
Shanghai	SJTU	1	1	1	6	68	8.82	
Zhejiang	ZJU	1	1	1	16	11′	7 13.68	
Guangdong	SYSU	1	1	1	25	15	8 15.82	

Taiwan's effort of cross-strait university cooperation

Compare 12 research-oriented with 19 non-research-oriented universities in Taiwan, this study found their cooperation activities with mainland China's universities did not shown significant differences. While various sector's universities make differences in their cooperation activities with mainland China's universities. The private universities have shown actively in connect with the universities in mainland China, the details have been presented in Table 3.

Type and sector	Universitie s	Number of universitie s	Average cooperation activities with mainland	t	р
			China		
Research-orient	Yes	12	40.0	1.40	.171
ed or not				3	
	No	19	50.8		
Sector	Public	21	39.2	-2.83	.008
	Private	10	62.2		

Table 3. Compare the number of cooperation activities with mainland China by different types and sector of Taiwan's universities.

Mainland China's effort to cross-strait university cooperation

The study collected 27 universities in the list of 985 Project. There are 10 universities located in cities, while 17 universities located in the limited 8 provinces or cities which for political reasons. According to our classification, there are 15 universities located in the limited 8 provinces or cities, 12 universities located in the other area. Their average of cooperation activities with Taiwan's universities is 16.3. The range of cooperation activities is from 4 to 34 in different universities. Based on the limited 8 provinces or cities for opening to study in Taiwan, this study did not find significant difference regarding to those leading universities' cooperation activities with Taiwan, see Table 4.

Table 4. Compare the effect of cooperation in mainland China's universities by							
different areas and limitations							
nivoraity?a	Tymes	N	Average number	4	- 10		

University's	Types	Ν	Average number	t	р
cooperation			of cooperation		
activities			with Taiwan		
City or	Cities	10	13.1	-1.54	.135
provinces	Provinces	17	18.2		
Within 8	Within 8	15	17.3	.67	.509
provinces/	provinces or cities				
cities or not	With other areas	12	15.1		
Classified the different types of cross-strait university cooperation

Types of cross-strait university cooperation in Taiwan

Based on the attributes of universities (types, research-oriented or not, and sector) and cooperative activities with the universities in mainland China, the hierarchical cluster analysis suggests that the types of Taiwan's universities can be classified 4 different groups by considered the data's Euclidean distance and average linkage, see Figure 1.



Figure 1. Dendrogram of hierarchical cluster analysis with Euclidean distance and average linkage

K-means presents the details of ANOVA test for three groups' differences in Taiwan's universities with their specific variables, see Table 5.

	Clust	ter	Erro)r	F	Sig. (<i>P</i>)
	Mean square	df	Mean square	df		
Туре	.733	2	.620	28	1.182	.322
Number of cooperation	7137.658	2	82.001	28	87.043	.000
Research- oriented or not	.308	2	.241	28	1.280	.294
Sector	.618	2	.198	28	3.122	.060

Table 5. ANOVA test for cluster differences in the three groups

Regarding to the number of cooperation activities, location in limited 8 provinces and cities or not, this study with square Euclidean distance and centroid method to linkage the result reveal there are three significant groups among the 31 universities in Taiwan, see Figure 2.



Figure 2. Hierarchical cluster analysis with square Euclidean distance and centroid method

K-means presents the details of ANOVA test for the three groups regarding to the number of cooperation activities, location in limited 8 provinces and cities or not, see Table 6.

	Clus	ter	Erre	or		
	Mean		Mean			
	square	df	square	df	F	Sig. (<i>p</i>)
Number of cooperation	7137.658	2	82.001	28	87.043	.000
Within 8 provinces or cities	2519.981	2	41.073	28	61.354	.000
The other provinces or cities	1178.400	2	27.948	28	42.163	.000

 Table 6. ANOVA test for the group's differences with number of cooperation activities and political limitation in 8 provinces

Types of cross-strait university cooperation in mainland China

What is the feature of the cross-strait cooperation among 27 universities in mainland China? According to hierarchical cluster analysis, this study conducted Ward method with square Euclidean distance and z transformation found there are three significant groups with their cooperation activities with Taiwan's universities under the constrain of location in provinces or cities and location in limited 8 provinces and cities or not. The details have been presented in Figure 3.



Figure 3. Clustering the cross-strait cooperation among 27 universities in mainland China

K-means presents the details of ANOVA test with the number of cooperation activities under constrains: "location in provinces or cities" and "location in limited 8 provinces and cities or not".

Considered the cross-strait political factor, the university cooperation activities are still interfered by current situation. This study assumed mainland China only opened 8 provinces' or cities' students can study in Taiwan, whether this political limitation will impact on cross-strait university cooperation activities? According to hierarchical cluster analysis, this study conducted Ward method with square Euclidean distance and z transformation found there are three significant groups with their cooperation activities with Taiwan's universities under the only constrain of location in limited 8 provinces and cities or not. The result reveals the universities located in the 8 provinces or cities have shown more university cooperation activities with Taiwan's universities under the universities under the 3 provinces or cities have shown more university cooperation activities with Taiwan's universities than that of others, see Figure 4.



Figure 4. University cooperation activities clustered by 8 provinces' or cities' limitation with Ward method

K-means presents the ANOVA test to verify the clustering with the number of universities' cooperation activities under the political constraints. The details of three significant groups have been presented in Table 7.

	Clus	ter	Erro	or	F	Sig. (<i>p</i>)
	Mean square	df	Mean square	df		
Number of cooperation	820.419	2	11.215	24	73.153	.000
Within provinces or cities	.076	2	.271	24	.281	.758

Table 7. ANOVA test the group differences of cooperative activities with political constraint

Similarity or dissimilarity of cross-strait university cooperation

Based on the simple linkage with z transform the data, this study found there are four significant groups classified by considered the universities' location. research-oriented type of universities or not, and number of current cooperation activities. First, figure 5 displays cross-strait universities with similarity group will create more opportunities of cooperation. For example, the NTCU in Taiwan may take advantage of similarities with the following universities in mainland China in terms of their deepen cooperation activities: Zhejiang University (ZJU), University of Science and Technology of China (USTC), Xiamen University (XMU), Southeast University (SEU), Central South University (CSU), Hunan University (HNU), Nanjing University (NJU), Sun Yat-sen University (SYSU), Sichuan University (SCU), University of Electronic Science and Technology of China (UESTC), Northwestern Polytechnical University (NWPU) Xi'an Jiaotong University (XJTU), Lanzhou University (LZU), Northwest A&F University (NWAFU), Dalian University of Technology (DLUT), Harbin Institute of Technology (HIT), Jilin University (JLU).

Second, National Cheng Kung University (NCKU), National Taiwan University (NTU), National Chung Hsing University (NCHU), National Taiwan University of Science and Technology (NTUST), National Taipei University of Technology (NTUT), National Chengchi University (NCCU), National Sun Yat-sen University (NSYSU), National Central University (NCU), Chang Gung University (CGU), National Yang Ming University (NYMU), National Taiwan Normal University (NTNU), Shanghai Jiao Tong University (SJTU), Tongji University (TJU), East China Normal University (ECNU), Renmin University of China (RUC), Peking University (PKU), Beijing Institute of Technology (BIT), Beihang University (CFU), Chongqing University (CQU) are similar group. These universities are located in cities areas.

Third, the other two groups show more numbers of cooperation activities with each other and most of universities in Taiwan belong to teaching-oriented purposes or technological universities. For better cross-strait universities cooperation, the suggestion goes to looking for similar universities to be partners in mainland China.

In this study, *k*-means presents the ANOVA test to verify the four clusters with the number of universities' cooperation activities under the political constraints. The details of four significant groups have been presented in Table 8.

Table 8.	ANOVA test the	e group differe	ences of coo	perative a	activities w	with type and
		location	of universiti	ies		

	Clus	ter	Erro	or		
	Mean square	df	Mean square	df	F	Sig. (<i>p</i>)
Research- oriented U.	.968	3	.183	54	5.296	.003
Provinces or cities	.398	3	.238	54	1.668	.185
Number of cooperatio n	9503.125	3	59.317	54	160.210	.000



Figure 5. The features of cross-strait university cooperation

SWOT analysis

Based on the previous SWOT analysis, this study provides suggestions for Taiwan:

- 1. The research-oriented universities with 985 project universities in mainland China have high feasible to create substantive cooperation opportunities. Supported by MOST, related cooperative projects will promote the cross-strait university cooperation.
- 2. Most of private universities have created more cross-strait cooperation activities in terms of their percentage share. These phenomena might reflect the fact that the private universities lack of international cooperation activities or need to reinvent their internationalization.
- 3. Long-term strategies in most of universities did not show so clear. It might impact on the effect of university cooperative activities.
- 4. Under current political constrains, how to break through the impasse to attract students or faculty from mainland China is important strategy. More active university cooperative activities are welcome to eliminate the boundary of cross-strait political reasons.
- 5. Clarify the fittest cooperative programs in different type of universities are necessary; then the effect of long-term university cooperation will achieve.
- 6. Teaching-oriented universities may focus their cooperative partners on the other 985 Project universities. Currently, the location of universities in mainland China is very important to create cooperative opportunities. The suggested 8 provinces or cities by mainland China is the best choice for Taiwan's teaching-oriented universities to seeking cooperative partners.

Table 9.	SWOT	analysis	for	Taiwan	with	cross-stra	itı	university	coope	ration	and
				e	xchai	nge					

Opportunities	Threats
 O1. Cross-strait cultural and education interaction still active O2. MOE and MOST support the cross-strait activities O3. Competitive resources are relative fair to acquire O4. Mechanism for personnel are still encourage 	 T1. China rising and her competition in different fields T2. China's attraction for academic talents T3. Chin's strong policy intervention for higher education T4. China's classification of higher education is effective T5. Competitions come from the outside never ended
Strengths	Weaknesses
 S1. Well-developed universities in Taiwan S2. Democratic mechanism in campuses S3. Universities focus on professionalism S4. Law and regulation are well-established 	 W1. Over expanded higher education and resource limited W2. Low salary cannot attract academic talents W3. Incentive of university-industry cooperation is not sufficient W4. Focusing on since and technology result neglected in the humanity innovation W5. Lack of cross-strait cooperation office in universities W6. Lack of resource for promoting cross-strait cooperation and exchange

Conclusion

What kinds of benefit already shared among the higher education institutes of cross-strait interaction? Because of insufficient precisely information in previous studies, this study evaluated the effect of cooperation and exchange by using the current web data. The result reveals both the number of interactive activities and the participated cross-strait cooperation universities in Taiwan are more than that of mainland China. Suggestions for further development will prompt to how to deepen interaction with institutes and wider the cooperation activities. This study also perceived the only approved 8 provinces or cities to study in Taiwan by mainland China, while this limitation did not constrain the cooperative activities with individual universities. From the view of Taiwan, how to enhancing the strategies for effective district cooperation has become more important in next stage cross-strait cooperation. Too wide or various institute interactive activities have exited for a long period, however it did not utilize the limited resources for effectiveness. For long term purposes, it is disfavored to Taiwan's universities. In mainland China, there are various planned activities for university cooperation and interaction have been found. The China's universities still directed by the central government or the campus's delegate of ruling party, while the universities perceived more institutional autonomy in Taiwan. Because of the cross-strait managerial principle did not fit well, how to

delimitate the dissimilarity toward the similarity is the new challenge for both sides of universities in future. Furthermore, the resources in universities are limited, to widen the cooperative activities is challenged. Therefore, creating union organizations or enhancing university cooperation in specific areas is an important strategy for Taiwan to face the new challenges of cross-strait university cooperation.

Finally, this study proposes the following suggestions to further developing cross-strait university cooperation:

- The strategies for active strengths and grasp the opportunities are: Based on current development, high quality human resources, government supported resources to create further moment of cross-strait university cooperation.
- Strategies for utilizing strengths to eliminate threatens are: Based on democratic and fair system, campus culture of respect on profession to diminish threaten from mainland China to attract Taiwan's academic talents.
- Strategies for grasping opportunities to improving weakness are: Based on government initiatives the industry-university cooperation and provide competitive resources for universities, the universities should reconsider their innovative entrepreneurship system to diminish the low salary and brain-drain issues.
- Strategies for improving weakness and diminish threatens are: The industry-university cooperation is inactive and the related encourage strategy is not enough in Taiwan. Lack of cross-strait university cooperation units or offices to implement and lack of interactive budgets are current problems that the universities confront with. Whether the weakness and threaten can be diminished or not? It will impact on the effect of cross-strait university cooperation directly.

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Education, Earth, Nature: Imagining Ecological Ways of Inhabiting the Earth

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Abstract

A new ecological culture puts Earth and Nature – and not only human beings – at the center of Planet's life. This change of perspective should be accomplished at every level: law, politics, economy, education. At an educational level, this choice concerns lifelong education since the earliest stages of life, and involves the development of more holistic mind-sets based on: (a) knowledge and understanding of phenomena grasped in their relations to one another (Dewey, 1933; Vygotsky, 1930, 1934) that connect human beings and the being of the Planet; (b) an ethics of respect and care (Capra, 1997), involving empathy with Nature, pro-sociality and cooperation, storytelling, reflective thinking, mindful understanding of emotions (Bruner, 1997). To support this view, I present an educational research design as an example of an experience in the field. Research with children (Kirk, 2007; Christensen-Allison, 2008; Moore et al., 2008; Mortari, 2009) is the methodology used. Such approach is evidence-based (Jean-Luc Maron, 2001; Berg et al., 2008) within the epistemological framework of the naturalistic inquiry (Erlandson et al., 1993; Woodhead, 1996; Graue, Walsh, 1998; Greig, Tailor, 1998; Punch, 2002; Mortari, 2002, 2004, 2007, 2009). Analysis will include children's thoughts regarding their weekly experience with nature (Leopold, 1970; Tanner, 1980; Thoreau, 1962; Chawla, 1998; Smith, Dunca, Marshall, 2005; Mortari, 2017; Dozza, 2018) that is part of the school curriculum. Preliminary findings suggest that by perceiving Nature through all their senses and by reflecting on their emotional connection with Nature, children acquire a new more systemic awareness and begin to feel as active agents of Earth.

Keywords: Sustainable Education, Lifelong Learning, Research with Children.

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1. A partial Introduction

The assumptions on which the education of younger generations was based until about a decade ago have fallen into a crisis that appears to be irreversible. It is a crisis that invests citizenship, welfare and labour market as a whole.

The technological revolution and the evident "economic deviations" have radically changed the aims, use and value of cognitive and professional repertoires. They have made workers more vulnerable to the changes in labour organization. Most importantly, they have had an enormous, distorting influence on the perception of certainty of the future, on the systems of values and on the lifestyles of entire generations and of most of the population.

The way we perceive and represent the concepts of *time*, *identity* and *relations* (rules, power relationships) is also changing.

Regarding *time*, we can say that communication between our experience of the present and the past and our outlook of the future has irreparably broken down. We live in a nowist, hurried and competitive culture (Bertman, 1998; Kundera, 1995). Time is "pointillist" (Bauman, 2009, p. 56), shattered into a multitude of isolated shards, capable of disabling the past through an infinite succession of "new beginnings".

The *Identity* itself has undergone a process of "pointillisation", to the extent that many now display it as an attribute of the moment.

The *Economy* is dominated by excess and waste, dissatisfaction, instant or programmed obsolescence. The lives of migrants, refugees, outcasts have come to be <</discarded lives>>, globalisation's waste (Contini, 2009; Bauman, 2004).

Indeed, the entire Earth is subject to waste and predation. And Governments are seen as succumbing to economic reason. Individuals risk to identify themselves as "consumers", rather than as "citizens". Many have turned away from politics, *as if* their freedom as citizens had been conquered once and for all, and *as if* democracy and the *Planet's being* (Hillman, 1997) could survive for long in the aftermath of political inactivity and indifference.

International *legislation* itself – Agreements, Resolutions, Treaties – is uncertain, because it originates from a balance of power between subjects with different natures and orientations.

Within the context of a planetary globalisation based on bonds of dependency and/or interdependency that can induce mutual development and wellbeing, but also vulnerability and crisis (Bauman, 2004), lifelong learning, the valorisation of the cultural and professional heritage, and *humanitas*, perhaps represent the main strategy for redirecting civil, cultural, social and productive processes towards a democratic and sustainable development.

2. A neo-paradigm: "Gaia Hipothesis"

According to Lovelock's "Gaia hypothesis" (1979), the Earth is a living organism capable of self-regulation, whose geophysical components support suitable conditions for life thanks to the behaviour and action of living plant and animal organisms. The systemic theories of the 20th century have revolutionised the scientific thought in the Western World by offering an interpretation of the Earth-Nature system that is ecosystemic and contextual rather than mechanistic and reductionist.

The core debate on the co-construction of an ecological neo-paradigm requires a transition from a human-centric ethical system, which assigns nature an instrumental value measurable in purely economic terms, to an eco-centric ethics based on the acknowledgement of its intrinsic value. This is a redefinition of the intentional quality of human and scientific intervention as instruments for improving the living conditions of the Community as a whole through new models for "inhabiting the Earth" (Farnè, 2017; Iavarone, Malavasi, Orefice, Pinto Minerva, 2017; Malavasi, 2015, 2008; Frabboni, Pinto Minerva, 2014; Mortari, 2009a; 2003; Galeri, 2003). It envisions a utopian 'Democracy of the Earth', legitimising the restraint of the interests of specific groups for the good of the entire Community through a redefinition of the intentional quality of human and scientific intervention (Cullinan, 2012; Diamond, 2005; Iovino, 2003; Tainer, 1988).

However, despite the international conventions and declarations – Stockholm/1972, Rio/1992, Kyoto/1997, Copenhagen/2009, Sendai/2015, and Paris/2016 – a new ecological culture rarely seems able to significantly influence the actions of the competent authorities in this field.

3. Sustainable development and education for the whole life

The most widespread and quoted definition of *sustainable development* is contained in the Bruntland Report on *Our Common Future* (WCED, 1987): <<Sustainable development is the kind of development that meets the needs of the present without compromising the ability of future generations to meet their own needs>>.

The issue of sustainability in the Man-Earth-Nature relationship has been addressed, in the field of education, with a number of different – albeit related – terms and concepts (Stevenson, 2007; Sterling, 2006): environmental education, education for sustainable development, education for sustainability, sustainable education.



The vision that underpins the concept of *sustainable education* envisages sustainability as a theoretical-methodological framework that consistently moulds, based on a sort of dynamic causality, the idea of school/educational contexts, educational actors, decisions relating to the educational setting, school curriculum and teaching activities (Calvano, 2017; Wals, Corconan 2012; Malavasi, 2010, 2003). It shares the perspective of lifelong learning. A natural and social process that begins in the first days of life (or even earlier) and continues until senility. In short, we can say that it is a three-dimensional concept: Learning through/in life (*lifelong learning*); Learning in the various educational contexts - formal, non-formal, informal (lifewide *learning*); Learning in depth or deep-rooted learning (*lifedeep learning*). The last dimension of the concept shifts the focus of debate and of research on the contextual, intra-subjective and emotional aspects that concur in the construction of reality at the individual and social level and that involve the capacity to relate deeply and critically with one's self - one's "generational roots" and cultural appartenances - and with others. It regards on the one hand the descriptive aspects of personal education and the training opportunities starting with school and family and widening out to the many opportunities in loco and in the life and labour places, and on the other hand the affective/emotional processes that create the anchors of sense at a personal and social level, according to the meaning of *lifedeep learning*¹.

¹ The term and concept 'lifedeep' indicates a process of identification, construction, valorisation of one's personal identity, which takes on the value of deep learning.

In the literature we find only a few attempts to define lifedeep learning. It is considered a new term that describes insights and in-depth evaluations that reinforce the self-realisation of personality in a globalised world where the capacity for in-depth comprehension is essential to acquiring international harmony and peace (Boucouvales, 2002; Longworth, 2003; Banks et al., 2007; Derrick, Howard, Field & Lavender, 2010). It is an intentional process in which language, speeches and religious, moral, ethical and social values, drop by drop, day by day, orient a person's beliefs, the ways in which he/she faces or shirks challenges and change, a person's opinion of one's self and of others, the encounter, the search for an agreement, the game of life (Stevens & Bransford, 2007; Demetrio, 2009). It is a process that creates a 'matrix' that is transmitted by the group to the individual (Foulkes, 1957) and, we may add, from one generation to the next (Hillman, 1999; Lo Sapio, 2007). A person's learning and education increases and transforms during his or her lifetime (*lifelong*), positioning itself in that vital space that it manages to create along the way in the various formal, non-formal and informal (*lifewide*)

The cognitive and affective-emotional dimensions – interconnected the one in the others and the one for the others – form the foundations on which to co-build, individually and as a community, stories and identities with a "bond" and "lifedeep learning" value. These foundations, real clusters of languages, skills-emotions-meanings-values, create "matrices" that can be transmitted from the group to the individual and from generation to generation (Dozza, 2012; Karlsson & Kjisik, 2011; CONFINTEA VI, 2010; Demetrio, 2009; West-Burnham & Coates, 2005; Foulkes, 1957).

Lifelong Education and Learning is a process *in progress*, unfinished, open-ended. It must become a <<learning process focused on the ideals and principles of sustainability>> (Wals, 2009, p. 26), capable of changing education from within, integrating sustainability not just in the curricula, also in the contexts of daily life and learning. It should integrate practice and theory, and include participatory and community-centred approaches, aimed both at understanding the interconnections and interdependence existing within the context of the planet, and at redefining concepts such as:

- "respect for nature";

- "responsibility to rebuild the *public space*" where men and women may negotiate individual

and common rights and defend them;

- "responsible self-limitation" or negotiate human rights (healthy environment, communication, intergenerational equality and sustainability, water.

Above all, an important purpose of the *empowerment* path is to rebuild the *public* space. <<In short, one of the decisive stakes of lifelong education aimed at 'empowerment' is the rebuilding of the now increasingly deserted public space, where men and women may engage in a continuous translation between individual and common, private and communal interests, rights and duties.>> (Bauman, 2009, p. 89). Men and women are required not just to make choices and act accordingly, but, above all, to defend such choices by strengthening cohesion, awareness and social responsibility as fundamental social and political goals (Rychen, 2004). The public space is the place for negotiating *third-generation human rights*, according to which the elements of nature are legal entities and not just resources at the service of mankind, including the awareness that the rights of the Earth also include the rights of human beings coming from Mother Earth. We refer here to the subdivision (initially proposed in 1979 by the Czech jurist Karel Vasak at the International Institute of Human Rights in Strasbourg) of human rights into three generations of rights that follow the three watchwords of the French Revolution, i.e. Liberty, Equality, Fraternity: (a) first-generation rights, dealing essentially with liberty and participation in political life (freedom of speech, freedom of religion, voting rights, the right to a fair trial); (b) second-generation rights, which began to be recognised by governments after World War II, related to *equality* (economic, social, cultural); (c) *third-generation rights*, housing an extremely broad spectrum of rights: to a healthy environment, to communication, to participation, to cultural heritage, to

educational contexts, all the more when it can count on personal 'roots' at an affective/emotional and cognitive level, and/or on groups, communities, social networks of reference (*lifedeep*).

intergenerational equality and sustainability, and, recently, to water (National Council Forensic, the Ministry of Justice, 2017).

4. An educational design

Based on the conceptions illustrated above, we present a research in progress².

4.1 Two Questions

- (a) Is it possible to bring the children to perceive the feeling of being part of a dynamic network of relations?
- (b) What are the indicators, if any, of the construction process of an environmental sensitivity, empathy and intelligence?

We have based the research on the assumption that it is generative to

- (a) gain *direct experience in nature*;
- (b) reflect in one's "den" about one's own experiences in nature;
- (c) think about the thoughts in general in/with the class group (Mortari, 2009a, p. 136). The Research Project (a multiple Case Study) includes children aged 4 to 5 in 2 kindergarten sections, and children aged 6 to 7 in two primary school sections (first and second year). The study's cyclic structure – based on the so-called Hermeneutic Circle model – allows applying of flexible educational proposals while keeping in mind logistic, organizational and methodological/educational aspects. The cycle of two – non identical – series is ideal as regards both the verification and validation of a research process balancing between theoretical processing and applicational verification, and the requirements of didactical significativity.

The single Case Study we are presenting regards a primary school, in Bressanone/Brixen (Bolzano/Bozen, North of Italy). The approach is that of 'Research-Action'. The subjects of the study are:

- 20 children, 7 years old, highly heterogeneous in terms of gender, culture/religion, social condition, handicaps;
- class Teachers and Treainee Teachers;
- Researchers (who participate in a non-intrusive manner and without hiding the the role they play);
- Parents in the role of witnesses and critical friends.

4.2 What we do in classroom and outdoor?

The "layout" of the educational path was illustrated by Billi, an imaginary character that for the children in first grade acted as a "unifying background" for the scholastic activities. Billi wrote to the children, presenting himself as the "guardian" of thoughts and emotions, and asked them to make a Notebook of "emotioned thoughts" for him. The first activities:

- informal interviews or "statements" made by the researcher/teacher leaving time for relaxed conversation;
- drawings and thoughts on "how do I feel today?";
- house/box of thoughts and emotions: children's writings or drawings that the teacher/researcher uses without revealing the author, to facilitate group conversation;

² The first section of the project is currently under way (January to May, 2018); the second will be held from January to May, 2019.

- selections of short musical pieces, sounds, colours to be associated with children's experiences; etc.

In a second time, the outings in contact with nature are held on a regular basis (on the same day, every week), in a setting that is carefully chosen by teachers and researchers in terms of quality of experiences:

- leaf collecting, scents, sounds, sensations;
- playing, running, rolling over;
- finding "your own den", namely a place where one can stop and 'think thoughts';
- choose an element of nature and tell "what makes me think" (a technique similar to photolanguage).

4.3 Methodology

The research we are presenting here is considered *evidence-based* (Berg *et alii*, 2008) and falls within the scope of the epistemological *framework* of *naturalistic inquiry* (Mortari, 2003b, 2010, 2014; Punch, 2002; Erlandson *et alii*, 1993).

The methodology used is *Research with Children* (Mortari, 2013, 2009a, 2003a; Christensen, Allison, 2008; Moore, McArthur, Noble-Carr, 2008) or *Children-centered research*. This approach is coherent with neo-Vygotskjian interactive-constructivist thought, whereby children are considered active subjects and co-producers of thought, capable of contributing in a valid and authentic manner to the educational research (MacNaughton *et alii*, 2007; Darbyshire *et alii*, 2005).

We present a single explorative and descriptive Case Study (CS) (Yin, 2003³), part of an inter-disciplinary multiple CS, titled *Visual Storytelling. Research for Children, Comprehension of Emotions* (VISTE), principal investigator Liliana Dozza in cooperation with Alessandro Luigini, Free University of Bolzano/Bozen.

In the preliminary phase, the meetings with the teachers allowed to share the general aims of the study and to get to know the characteristics of the class and the educational choices. It was decided to carry out the actual lessons both in the classroom and "in nature" (in a public park very close to the school). In planning and starting the research study, we have paid great attention to both the educational return and to the good quality of the experiences presented to the children, because although it is true that they are <<a>active and competent>>, they are also subjects that are <<vul>

This CS makes use of many investigation techniques and procedures, so as to collect different types of data for triangulation:

Parents: (a) Focus Group at the start and at the end of the project; (b) *Anecdotal Records*, i.e. brief descriptions of "short episodes" observed at home: sentences or behaviour relating to the experience under way at school.

Teachers: (a) Interview at the start and at the end of the project; (b) Logbook.

Intern (trainee Teacher) and *Researcher*: observation/written description of the experience in the park and in school, noted down at the start, midway through and at the end of the experience itself; logbook and field notes.

Children: (a) individual "Den Notebook"; (b) at the start and at the end of the experience, answer to the question: <<If I say the word "park", can you write down the first three words that come into your mind, and why?>> (c) drawing of the park, at the start and at the end of the experience.

Data analysis Workshop are envisaged in the course of the research project so as to allow for the interaction of different data analysis and theory construction procedures. In this way, although epistemic principles and a work path have been defined, the method can take shape during the process based on continuous exchange and reflexive dialogue. Obviously, the analysis of the drawings as well as of the interview protocols and Focus Groups envisages the parallel work and exchange of information of two researchers.

4.4 Expected results

We expect to:

- confirm and/or expand our knowledge about the world of the children;
- carry out a critical analysis on the heuristic methods and techniques used.

The knowledge and awareness of the conceptual evolution can be graded via a series of indicators³. The comparison of significant experiential situations and active listening will give shape to the process and shall provide data to be used in a descriptive as well as possibly interpretative reading of the CS.

4.5 Early Findings

Preliminary findings suggest that by perceiving Nature through all their senses and by reflecting on their emotional connection with Nature, children acquire a new more systemic awareness and begin to feel as active agents of Earth. The children's competence to feel part of/in the Planet is increasing. It concerns the ability to

- recognize their experiences/emotions;
- express them;
- reflect on them;
 - give value (in some cases, declaring themselves "friends" and "guardians" of the park).

³ In the current phase of the research process, using the literature and the research studies mentioned as reference, we can imagine the following indicators:

⁻ Knowledge, sensations, emotions: knowing facts about trees, insects, sounds, colours, surfaces, etc..

⁻ Discoveries about life of/in the park and of the "threads" that connect the beings living in the park with us.

⁻ Signs of change in the concepts about the park and about nature.

⁻ Explicit signs of change and awareness of this change.

⁻ Awareness of this and of the reasons that have brought it about.

⁻ Imagining ways of living in contact with nature.

5. Building an ecological mindset

In this section we present and discuss the theoretical framework of the proposed research.

5.1 A Sustainable Education since the first ages of life. Why so early?

Research, with particular reference to educational neuroscience, suggests that neural plasticity and cognitive modifiability are distinctive traits of the brain at all ages and, in particular, in the early stages of life.

[...] early interpersonal experiences (largely emotional) are able not only to develop cognitive skills, but also to act as regulators of hormones that directly affect genetic transcription, causing certain genes to express themselves and "silencing" other ones. [...] Brain development is largely a process that depends not only on a genetic programme, but also on both positive and negative experience (Oliverio, 2015, pp. 10-11).

The earliest ages of life are a "work in progress", a "proximal developmental area" for future lifetime: infancy and puberty have a key role in formative experience. The basic idea is that the educability of humans calls education: during these stages we must ensure the scaffolging for development and maturation, and developing, in order not to compromise the mind's ability to continue to learn over a lifetime. We *do not need to provide* the full range of competences required for life, but support the conditions for maturing and developing for the future life (Dozza, 2017; Fabbri, 2016).

5.2 Which children, which idea of classroom, learning-teaching and of school?

We see each *child*, during his or her growth, as a subject, an active agent of his or her development, as part of <<a transpersonal network with affective-cognitive relevance that is comparable to a magnetic field>> (Foulkes and Anthony, 1991, p. 211). This relational framework is made up of <<vertical>> or family-based networks (connecting three, or even four, generations) and <<horizontal>> networks made up of peer groups in the non-formal and informal contexts of socialisation and education (Bruner, 1999¹; Pontecorvo, Ajello, Zucchermaglio, 1991¹; Vygotskij, 1992, 1990).

We think of the *classroom* as a <<community of learners>> and of *learning-teaching* as a process of transformation through participation in significant activities (Rogoff, 1994), in contexts where teachers and children together co-build knowledge processes and experiment forms of meta-cognitive reflection.

We see the *school* as a complex system that should be <<open inside>> and <<open outside>>. We see the natural and urban environments as a huge "outdoor classroom", a "workshop of knowledge" and a "workshop of thought and imagination", an interactive textbook, a field of action and "playground" for the imagination (Frabboni, Pinto Minerva, 2018⁴; Frabboni, Gavioli, Vianello, 1998; Dozza, 2006, 1993; Frabboni, Guerra, 1991).

We see a school that treasures <<not only the natural spaces and the immense biodiversity wealth of flora and fauna, but also the great heritage of monuments and artworks, the intangible heritage of local communities>> (Marchetti, 2012, p. 15).

5.3 How? Based on which educational and teaching project?

Two key challenges for schools:

- lay the foundations for imagining new conceptual "frames";
- experience first hand the ethics of respect and of caring.

In *Experience and Education* (1938) Dewey gives a concise and complete description of the characteristics and qualities of the experiential paths along which to co-build *lifedeep learning*. He writes that the key problem of an education based on experience lies in choosing the type of present experiences that will live fruitfully and creatively in the experiences that follow. Each experience receives something from those that came before it and changes the quality of those that follow (*principle of continuity* and *principle of growth*). Furthermore, the educator – when developing the learning "situations" – must combine the subject with the context within the experience, so that school work be the result of a collective endeavour (*principle of interaction*).

In How We Think (1933), Dewey focuses on the relations between information learned and comprehension.

"Of course, intellectual learning includes the amassing and retention of information. But information is an undigested burden unless it is understood. It is knowledge only as its material is comprehended. And understanding, comprehension means that the various parts of the information acquired are grasped in their relations to one another – a result that is attained only when acquisition is accompanied by constant reflection upon the meaning of what is studied" (Dewey, 1933, pp. 78-79).

In the experiences in natural and cultural contexts as "workshop" of knowledge, in a school making space for knowledge, thought and imagination, school knowledge can once again find its 'soul' and, through a <<returning wave>>, enrich <<the meaning>> of the educational experience inside the school. Experience must be something "more and different" from simple activity.

"Mere activity does not constitute experience. It is dispersive, centrifugal, dissipating. Experience as trying involves change, but change is meaningless transition unless it is consciously connected with the return wave of consequences which flow from it. When an activity is continued *into* the undergoing of consequences, when the change made by action is reflected back into a change made in us, the mere flux is loaded with significance. We learn something" (Dewey, 1916, p. 163)

Experience in a natural and cultural context, far from the frenzy of everyday life, is becoming more and more important. It is important to help them realise that emotions are 'in-between', so to speak, that they flow within one's body like the sap in a plant, that they can be found inside the stories they listen to, as well as outside, in the colours of life (Mortari, 2009a; Smith, Duncan, Marshall, 2005). One can learn

through experience, by listening, taking part in discussions, reading books, and then thinking of one's experiences and feelings, "shadowing" one's emotions and thoughts.

5.4 "Feeling-thinking-imagining" is the alphabet for the future

The combinatory process – following the experience accumulation phase and a period of maturation and incubation – can operate by using not only personal experience but also that of others ("crystallised" into stories, fairy tales, scientific descriptions, material and immaterial culture) until it manages to produce something that is actually new.

This results in a two-sided and mutual dependency between imagination and experience, whereby every intuition and discovery has an affective-emotional tone and cognitive depth: the experience (the situational experience and the mediated experience) "feeds" the imagination, and the imagination, in turn, drives the action. We must create the conditions in which the imagination "in thought" and the imagination "in action" (Vygotskij, 1990, pp. 117-142) can amplify the space for free movement and therefore for autonomy between "myself" and the "World" (Winnicott, 1975).

In this way the potential of creative imagination works: the logic order binds with the imaginative disorder to meet requirements, tendencies and desires, as well as the challenges that reality throws us. The perceiving, "motor of imagination" becomes the new alphabet on which to invest in the future: only the "imaginal energies" are able to innovate, to invent, to push the gaze more deeply and further on (Semeraro, 2006).

5.5 How? Experiencing ethics of respect and of caring

Experiencing ethics of respect and of caring need:

- empathy, pro-sociality, reflective thought, acknowledgement and comprehension of emotions, telling stories, negotiation of points of view, cooperation (Pinto Minerva, 2017; Gennari, 2017; Mortari, 2013, 2009b; Bruner, 19971);
- *solidarity*, that makes possible empathic experiences and activates participative tension towards others, towards nature, and towards oneself (Frabboni, Pinto Minerva, 2014).

To engage in solidarity means to exchange gifts and opportunities to be shared, acknowledging that "No man is an island. We are bound to each other even if we do not know it" (Tischner, 1981, p. 12).

5.6 Caring asks to learn to de-center

The simplest way is to experience (and comprehend) it situationally, through example.

- Caring involves learning to come so close as to/so as to hear, think, feel (*as if* one were in another one's shoes) and then move away to think about it. It is a back and forth "movement", a "pendulum movement" that allows one to come close without remaining caught up/stuck/too involved and to move back by just the right

amount to allow one to stop and think. Just like when one observes a painting and comes up close to examine the smaller details, and then moves back to appraise it with an overall view of it as a complex whole. Or like when one is standing in a natural setting and one breathes in, tastes and listens to life, and then one finds one's self in a "den" or a special moment in which one can stop to feel one's emotions and think one's thoughts.

One must allow one's self time: aim is not to solve the problems but to understand them, expanding the space of thought and of action for one's self and for others. Also because, if the project truly regards *caring*, the limit-idea must be that of doing it in a donating fashion, i.e. by creating the conditions in which others (children, adolescents, adults, the elderly) can personally experience the intuition and awareness of being capable of doing it, and have the time to find their way while feeling they have chosen it and gained it autonomously.

Conclusion

We have discussed about promoting a *sustainable education* in the first ages of life, especially with regard to experiencing nature, as a lifelong, lifewide, lifedeep learning strategy. We have set out our idea of *child* as an active agent of personnel development, of *classroom* as a Community of learners, of *school* "open inside" and "open outside", of *learning* as a process of transformation through participation in significant activities and sustainable contexts where teachers and children together cobuild knowledge and meta-cognitive reflection: a learning process interested in looking deep, grasping information in their relations, experiencing emotion "inbetween" life, stories, discussion, "shadowing" one's emotions and thoughts.

We have presented an ongoing research and discussed our theoretical and methodological frame: Why so early? How lay the foundations for imagining new conceptual framework? How experience first hand the ethics of respect and of caring? When the education become "to know to and how" rather than " to know that", it shifts the focus of the speech and research and allows one to experience a culture of exchange and dialogue. It conceives and organises sustainable contexts for learning and learning to live in a collaborative dimension. Mental attitudes, postures, skills and behaviours are passed down from the adult (and the educational settings' coherence) to the children (L. S. Vygotskij, 1992, original ed. 1930; Robtzov, 2005). We need adults who play a *tutoring* and *mentoring* role that can transpose command of matter and *expertise* and allows to experience in situation *humanitas, emphaty*, respect for diversity and differences, with the intent of educating not just the producer/consumer but primarily the citizen (Baldacci, 2016).

Building an ecological mind-set is a *Utopia*, a Big Project for Little Learners, that we want to believe will be realized for all children, men and women of the Planet.

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Didactic and Pedagogical Implications in Community and Arts

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Abstract

This paper explores the relationship between art practice and dialogic forms of education. Drawing on theoretical framework and interviews with selected artists and stakeholders, the text examines these practitioners' constructions of art practice and the perceptions of how they engage with learners. The reflections illuminate the opportunities afforded by artist-led teaching and learning, whilst drawing attention to some of the future challenges. The author introduces the concept of Community Arts and Music, as scientific discipline rooted in its practical origins, to the Italian artistic learning scene, engaging to provide information on the current situation of CM and to be descriptive as to the characteristics and different contexts. The model serves to help place art and music-making in the hands and voices of everyone by creating equal opportunities for people to enjoy active and creative participation in music and in the arts. The learning approach involves different groups of children, adults, young people, refugees and ethnic communities as well as other minority groups: recent research delivered strong and consistent evidence to suggest that group arts and music making is a powerful personal and social health promotion activity.

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1. Introduction

«Art does not solve every kind of problems, but makes us aware of their existence», sculptor Magdalena Abakanowicz has said. Years of research show that art is closely linked to almost everything that we as a nation say we want for our children and demand from our schools: academic achievement, social and emotional development, civic engagement, and equitable opportunity. In Europe, the role of arts education in forming the competences for young people for life in the 21st century is subject to many competing demands which have an influence on the organisation and content of arts education. Increasing globalisation has brought both benefits and challenges, including those arising from increased international competition, migration and multiculturalism, advancements in technology and the development of the knowledge economy. The education system may be viewed as a means of preparing children for their role in an increasingly uncertain world. Schools have a part to play in helping young people to develop a secure sense of themselves, both as individuals and members of various groups within society. There is also a recognised need to encourage young people to develop a wide range of skills and interests, to identify and foster their potential and to encourage creativity. Much of the educational focus in recent years has been on prioritising literacy and numeracy, both as a sure route to employment for pupils, and as the mechanism for building a 'knowledge economy'. Concerned that creative subjects are sited an extra-curricular area of education, and so not for everyone, artist and educators have set out their different approaches. According to Fran Smith, «Involvement in the arts is associated with gains in math, reading, cognitive ability, critical thinking, and verbal skill. Arts learning can also improve motivation, concentration, confidence, and teamwork» (Smith, 2009). The Arts can connect people more deeply to the world and open them to new ways of seeing, creating the foundation to forge social bonds and community cohesion.

For this reason it is important to stimulate a strong artistic programming in all educational contexts. For John Dewey (1951), every person is capable of being an artist, living an artful life of social interaction that benefits and thereby beautifies the world and art functions as experience. According to this theoretical approach, the European Parliament's 2009 Resolution on Artistic Studies in the European Union¹ has put forward key recommendations for the development of artistic education and has called for greater coordination of arts education at the European level: research on the potential of arts education to enhance the creativity of young people has underlined the need to continuously improve its quality. To help meet this need and help identify best practices, Eurydice Research instrument of European Union in 2009 has produced and interesting overview of the state of artistic and cultural education in Europe. According from foundings of research, educational systems are increasingly recognising the importance of developing children's creativity and contributing to cultural education.

Taggart et al. (2004) found that nearly all of the 21 countries/states in their international study had similar aims for the arts curriculum. These included: developing artistic skills, knowledge and understanding, engaging with a variety of art-forms; increasing cultural understanding; sharing arts experiences; and become

¹ http://www.europarl.europa.eu/

discriminating arts consumers and contributors. In addition to these artistic outcomes, personal and social/cultural outcomes, such as confidence and self-esteem, individual expression, teamwork, intercultural understanding and cultural participation, are emerged from arts education in most countries. In particular, a new focus on creativity (often in relation to its importance in innovation) and cultural education (in relation to both individual identity and promoting intercultural understanding) is apparent in the goals of arts education. In the European system, and even more so in the Italian system, the teaching of the arts is entrusted to a general teacher. but often these teachers are helped by the professional figure of the experienced artist outside the school.

2. Art for social bonds and community cohesion

John Dewey believed art communicates moral purpose and education. According to Patricia F. Goldblatt, changed perceptions, increased interest, and moral sensitivity engender thoughts and actions in regard to societal roles and responsibilities. As Dewey mentioned, art serving as a child's curriculum, art «[...] provide[s] the material affording [...] a consciousness of the world in which he/her has to play a part» (Dewey, 1897, 77-80). Art deepens understanding by vicarious entry in worlds symbolized beyond personal context. Art suggests touchstones in comprehending overarching values that unite societies, for «[...] art is the most complex expression of longing and aspirations of a society» (Dewey, 1934). As a tool to erase bias, art expresses global experiences. Since the publication of Francois Matarasso's Use or Ornament (1997) in particular, there has been an increasing amount of academic and policy literature devoted to the importance of the arts and culture to the wellbeing, personal growth and social development of the individual within civil society. There has also been an ever growing body of academic literature attesting to the blurring of boundaries between audience and spectator (Bourriaud, 2004), professional and amateur arts (Gablik, 1991) and continuing debates as to the role of the artist and authorship (Bishop, 2006) and to the nature and future of what is termed 'art' today (Booth, 2009). The increasing use of arts activities led by professional artists in projects related to community and neighbourhood regeneration are an important alternative of education in informal and non formal context, (Howard-Spink, 2005). To achieve the community the knowledge transfer play an important role: there is an increasing recognition of the use of art and the skills acquired in participating in arts activities as а means of creating knowledge and developing understanding in other spheres of living (Kafewo, 2010). Recently, new directions in practices and modalities throughout the arts, as the public participation and social change, for example, (Bourriaud, 2004), have strongly demonstrate the importance of practice in the arts from school activities to the community. A significant number of factors seem to positively influence community's (including the cultural community) perception of school attractiveness. These include:

- School as an open learning centre, where school provides opportunities for multiple forms of participation—that nurtures communities which students jointly develop their learning potential to its fullest. The vision is of a school in which learning is fostered as shared enterprise, participation, engagement, contribution, connection, experimentation, inquiry, reflection, identity. In this way, school

promotes individual responsibility is the sense of connectedness that grows out of membership and participation in a community.

- School as a hub of local life, where even community life generally is growing everywhere. Schools that provide a range of services and activities, often beyond the school day, to help meet the needs of children and young people, their families and the wider community². Schools are community hubs, where all people can stay active and learn and participate in the activities of community based organisations. The community use of schools program helps students, parents and members of the community to be more active in a safe and healthy environment.³ School as and for community, a location where services can be accessed, that contribute to the health, wellbeing and learning of children and young people directly or indirectly via targeting families and the local community. Partnerships between the school and other agencies are created to deliver services to the school and wider community using a right service at the right time philosophy.
- School as place to promote the wellbeing, safety and education of students as a priority, promote schools to be the centre of neighbourhoods and communities, to provide improved access to services, facilities and programs for all promote a sense of pride in sharingour schools with communities, to demonstrate practical applications of how schools and community can work together to share their facilities.
- School as cultural institutions, where all children should have access to inspired teaching and creative learning through the arts. By building a culture of arts-driven collaboration and inquiry in community, arts has a measurable impact on students and teachers alike.

According to recent studies (Ramsden, Milling, Phillimore, McCabe, Fyfe, Simpson 2011), also for the development of society and community, the research demostrates the arts within education provide one alternative for states looking to build the The arts can provide effective learning opportunities to workforce of tomorrow. the general student population, yielding increased academic performance, reduced absenteeism, and better skill-building. An even more compelling advantage is the striking success of arts-based educational programmes among disadvantaged populations, especially at-risk youth (El Sistema and Mus-e, constitute an impressive examples). For at-risk youth, that segment of society most likely to suffer from limited lifetime productivity, the arts contribute to lower recidivism rates; increased self-esteem; the acquisition of job skills; and the development of needed creative thinking, problem solving and communications skills. much However, very little has been explored concerning the effect of grassroots arts activities, and by this we mean here amateur arts activities, on the individual and on the communit/v/ies within which the activities take place. Broadly speaking, amateur arts activity is unregarded, unstudied and poorly represented, largely because its

² UK Department for Education and Skills, 2006.

³ UK Department for Education, 2013.

artistic content is perceived to be weak and its politics retrogressive and exclusionary. Such arts activity is visible as community activity, but invisible in the arts literature. Yet, if the claim is made that arts participation can operate both as community generating and enhancing, we need to know how these grassroots arts organisations serve and produce understandings of identity, locatedness, economy, culture, wellbeing and community.

3. Community Arts and Community Music: an innovative approach based on the practice. First foundigs from research

Community Art is an art process that involves professional artists and community members in a collaborative creative process resulting in collective experience and public expression. It provides a way for communities to express themselves; it enables artists, through financial or other supports, to engage in creative activity with communities; and it is collaborative – the creative process is equally important as the artistic outcome (Ulbricht J, 2015). Through the data of my recent research in 5 schools of Reggio Emilia⁴, Community Art is a way of including people, describing creative activities that bring people together in their communities and that give people the opportunity to gain new skills and new opportunities. Community Arts works to nurture the potential that exists in all communities to be creative and to find a voice to express their concerns through and using the Arts. Community Art is a new educational approach to integrate diversities; Community Arts sector is a sector of change, a sector about change; we are transforming lives, and this dynamic means that we need to be especially clear about what we are aiming to do.

Although quite varied, community arts programs are grassroots organizations that attempt to use the arts as a tool for human or material development (Costello 1998). Community arts programs almost universally involve community members in a creative activity leading to a public performance or exhibit. But how can we improve this practice in educational context in Italy? Which are the main key-concepts connecting on the theoretical framework?

Numerous studies reveal six benefits associated with arts in schools and community, including better reading and language skills, mathematics skills, thinking skills, social skills, motivation to learn and a positive school environment (Ruppert, 2006). Research data also tells us, that children in Reggio Emilia City do not have equal access to the arts in school. In this context, promote an Art program in the school, connected with the school curriculum, but applied as well in the school time or after school, can be very effective in contributing to the creation of community of practice, within the poor area of the city.

⁴ On September 2017 the Faculty of Education of Free University of Bolzano approved a Research on the role of art in education with special focus on the primary school. The research is now in progress. The model of Reggio Emilia Approach has been applied to 5 primary schools in Reggio Emilia. The title of the project is *Art and Beyond. Mus-e for an inclusive and educating community*.

As argued by David Elliot, Full Professor of Community Music at the New York University,

[...] Citizens must relate to the complexity of the world around them not exclusively through logic and pragmatic knowledge. One of the fundamental competences of active and responsible citizenship is narrative imagination, the ability to think as another person, to be an intelligent reader of one's story, to understand the emotions, expectations and desires of those in front of us (Elliot, 2017).

The research for such empathy is an essential part of education and democracy understanding, both in West and East. A large part of it must take place within the family, but schools and educational agencies are also called upon to carry out a fundamental task in this direction. To accomplish this task, training agencies operating in formal, informal and non-formal contexts in Italy must assign a prominent place to artistic subjects by cultivating a participatory type of training that activates and perfects the ability to see the world through the eyes of another person.

Community Arts is an art process that involves professional artists and community members in a collaborative creative process resulting in collective experience and public expression. It provides a way for communities to express themselves; enables artists, through financial or other supports, to engage in creative activity with communities; and is collaborative – the creative process is equally important as the artistic outcome (Ontario Arts Council, 2002).

Under this umbrella, born in 1990 Community Music Activity(CMA) Commission into ISME, International Society for Music Education. CMA states «[...] that everyone has the right and ability to make, create, and enjoy their own music». The commission's mission statement stresses that «[...] active music-making should be encouraged and supported at all ages and at all levels of society» and that Community Music activities «[...]provide opportunities to construct personal and communal expressions of artistic, social, political, and cultural concerns» (CMA, 2016). Thus far, it is possible to abridge a possible understanding of what Community Music is as music making activities outside of formal training institutions with special partnership possibilities between the formal, non-formal, and the informal music education settings. What distinguishes Community Music activities from other more traditional types of participatory music making activities is the intention to create spaces for inclusive and participatory music making. Inclusion is a very important concept for the understanding of Community Music as it «[...] comes from a belief that music making is a fundamental aspect of the human experience and is therefore intrinsic and foundational part of human culture and society» (Higgins, 2017, p.3).

Best known in North Europe than in Italy, the Community Art (CA) and Community Music (CM) models constitutes a new pedagogical approach, as a framework for progress towards an arts-rich culture of learning in every school and local communities. Through the CA and CM approach can individualize strategies to support innovation, collaboration, change school-wide, across Reggio Emilia City. The activities – part of the research project *Art and Beyond. Mus-e for an inclusive*
and educating community - are opened to all children and parents and members of local community.

Teachers and pedagogues have a special responsibility to make sure that all children have an opportunity to come into close contact with art and culture every day. At a fundamental level, cultural and practical experiences shape us as human beings, strengthen our ability to learn, and cultivate us as democratic citizens.

To achieve this goal, the research process - since in progress - is focused on five main questions:

- How we create an optimal framework for children to encounter art and culture in their everyday lives?
- Why children's relation with art and culture strengthen democracy?
- Why art and culture should be an integrated part of pre-school and school and all subjects taught in general-education schools and should be conceived more broadly in teacher education programmes?
- Why an everyday interaction with art and culture in school or day-care has a positive effect on societal development and socio-economic conditions?
- How people can best collaborate in practice when teachers, pedagogues, artists, and cultural mediators are blazing new trails together?

Interviews with stakeholders, focus groups with teachers and artists of the schools involved, currently have highlighted interesting summaries to build the arts activities in schools. For examples, many of the teachers argue that throughout the 20th Century, children's culture mediators have observed that children are champions in creating decisive transformation of themselves through play and time spent together: the authentic encounters with art and artists can support this process because experience authenticity can be seen and heard by the all people. It can be felt and noticed by the participants. For a certain time it rules over body and soul, space, conduct and feeling. Forward in your seat, back in your chair, under the carpet, on your feet, run, jump, cheer, laugh, giggle, cry and hold your breath. The wonder, the scepticism, the waiting, the disgust, the sneer, the enthusiasm, the surrender. That is what makes an experience authentic. Art's activities has to promote authentic experiences: theoretical basis for understanding phenomenon is still the practical/musical subjects and their theories about the sensitive path to knowledge, recognition and experience in which this field is included and it is still the theories about the importance of practical/musical subjects in our daily lives and in our relation with art that give us the tools to understand the scope of the significance of this dimension in our lives.

The perception of the teachers is that the classic educational ideal is being phased out. If a new one, which is more in line with our times, has to be created, it will be oriented to the ideal of *citizenship*, and mainly cultural citizenship, better. From this perspective, culture covers both artistic forms of expression and the life patterns we live by. Culture is defined as the execution of art and culture both for and with children, but especially by children. An important intermediate goal of artistic activities with children is that we continuously support possibilities to develop the

competences necessary to master a cultural citizenship. The children's relation to art and culture has a key role in this endeavour (Mayesky, 2008).

The Italian arts education system needs, also, a reform of teacher training, aiming to strengthen the competence of each teacher as regards understanding the meaning of aesthetics, since it is crucial for teachers to be able to pass this knowledge onto their students. It could be important to implement offers and funds that can be used from the primary school teacher to active practice of art in the lecture with particular attention at the laboratories. This can be a first small, simple, yet important step if a teacher or an enthusiast is familiar with the possibilities of giving children the opportunity to come in close contact with art, enrich the lessons and relieve the pressure on teachers.

About the different arts, teachers, artistis and pedagogues agree that practical/musical subjects must be mainstreamed into the schools (Holdhus, 2018), i.e. integrated into the different subjects. One of the great potential aspects of practical/musical subjects is that they can fit into many contexts because they are so closely related with abilities such as creativity and innovation. Art has a transfer effect because it influences one's learning potential in other subjects. For example, the principles in music and mathematics are closely related as in the case of Renaissance art and mathematics with the golden ratio, the perspective etc. Access to practical/musical subjects can therefore give children the key to school subjects - obviously, with the culture they seek out as a point of reference. For they certainly are on the aesthetic plane when they listen to rap music, for example, which has both a musical, vocal and lyric dimension and which can easily be used as an approach towards understanding the lyric's poetry better and the tradition of combining music with lyrics, which goes far back in human's history. This approach is a fantastic way to open entirely new universes to children and youths, if only conveyed to them in the right way. Some statistical data results has concluded that the children who received good and ample training in music, drama, dancing and visual arts performed better than other children and some of them showed greater commitment in voluntary social work, they completed higher levels of education, got better jobs and had more friends in addition to having numerous active and passive art experiences.

About creativity, recent studies expose there are probable relations between being creative as a child and being creative as an adult (Mayesky, 2008). Thus, children who score high in a creativity test would most likely develop into adults who dare think differently, use their imagination and take chances. The study, based on new international research, deals with preschool children.

The most extensive survey on the quality and effect of education in aesthetic subjects is led by professor Anne Bamford, University of the Arts, London, who in 2006 pointed out that education in practical/ musical subjects must be good, otherwise it will do more harm than good. One UNESCO⁵ survey which has covered more than 60 countries concludes that good education in artistic subjects promotes children's language literacy, amongst other things, and children in countries where the schools have a lot of artistic subjects in their curricula do best in mathematics, reading and

⁵ https://sustainabledevelopment.un.org/content/documents/919unesco1.pdf

natural science subjects, i. e. exactly the subjects which are the object of high-profiled PISA⁶ surveys. Here, we have caught a phenomenon which is often referred to as the transfer effect, i. e. the possible positive effect that learning within one subject has on the learning in another subject. One example: By singing, dancing or playing an instrument the child learns not only singing, dancing and music but also some mathematics because the child is training physical and emotional understanding of note duration and intervals, i.e. fractions. Drama, dancing, visual arts and music can develop and reinforce happiness, creativity, imagination, flow, abstract thinking, concentration, emotional intelligence, character formation and other basic elements of good life.

These qualities are completely irreplaceable in the child's socialisation and learning because all other learning is based on them. This is also true for the desire to learn itself. Each of the subjects individually contributes with subject-specific transfer qualities. Art must not be considered only as an experience in itself, but rather it must be related to the psychology of individuals and to the socio-cultural realities from which it springs: the ultimate goal of the child's creative activity should not be the *artefacts* he realizes, but rather the ability to observe, the mnemonic skills and imagination, that art helps to develop and which give the individual good critical and problem-solving skills for him - herself and for the community in which he/her is included (Dewey 1934).

4. Artist in school educational system

«A teaching artist is a practicing professional artist with the complementary skills and sensibilities of an educator, who engages people in learning experiences in, through and about the arts» (Booth, 2009).

Many art teachers originally train as artists. Consequently, many art teachers experience contradictions in their career development that seriously impact the construction of their professional identity as both art teachers and artists. Many find that the demands and rewards of public school teaching can mitigate against the art teacher's development as an artist. Because of this role conflict, over time, some art teachers leave teaching to become professional artists, while others give up their personal artistic production during their teaching careers. Inevitably, there are some individuals who balance both careers of artist and teacher, and others who have integrated artistic behavior as a model for teaching. The meeting with artist and teacher in the school is an important impact factor to have successful education art's activity. The educational system must not only ensure that all teachers have the necessary competences, but also to al- low teachers to meet artists and get the artists to go to the school and cooperate with teachers on a creative lesson plan, which is not considered a break from everyday life but gives children new competences in new areas: teachers are familiar with the educational targets and methods whereas artists know the essence of art and culture. Moreover, for the children it is an advantage to meet professionals other than teachers in educational contexts because this way the children get to know the essence of art and culture.

⁶ http://www.oecd.org/publications/pisa-2015-results-volume-i-9789264266490-en.htm

According to *American Association of Teaching Artist⁷*, the role of the teaching artist is an integral part of the overarching arts education constellation, which includes:

- short and long-term school and after-school residencies
- arts experiences, including in-school performances by professional artists, as well as field trips to studios, galleries, museums, and performances.
- integrating the arts throughout the curriculum as a way of engaging all types of intelligence's in the learning process.
- arts education standards backed up by ongoing curriculum-based arts instruction in pre-K-12.
- discipline-specific learning in the arts: visual art, dance, theater, music, poetry, etc.
- higher education and on-going development for the professional artist, as well as the professional artist who is also a teaching artist.
- lifelong learning in the arts through community arts events, classes and workshops.

Successful teaching artists help provide a tangible link between the creative process and all kinds of learning, and they make manifest in classroom and community settings the human drive to survive by making meaning of the world: teaching artists today are a crucial resource for the future of arts education, the arts in general, and the overall process of learning.

Conclusion

Art and culture are some of the aspects that characterise our way of thinking and our behaviour something that children photograph as quickly as a lightning and that plays an important role for their ability to express themselves as people and learn to become part of communities with others. The conscious pedagogical educational process that shapes children throughout their growth starts as yearly since the nursery and later at school. Children's institutions and schools are a daily arena where all children go about. It is here that they spend most of the hours they are awake and most refreshed, and it is here that we have the best opportunities to ensure that all children in Italy will receive the necessary artistic and cultural ballast. A specific Art Programme (in formal, informal or non-formal context), is an excellent opportunity for children to meet artists in their everyday lives and gain insight into artistic and creative processes.

Art is connected in a fundamental way to a human being's inherent desire to play, that help us to play our way towards acquiring social skills. Playing is learning how to get on with other people. Art also allows adults to continue to play because it puts people in a conceptual space, in an creative space that is all about empathy and the ability to empathise, about basic social skills. This applies to all of social life, because when it possible to manage to work together, discord and conflicts will not arise. It is important that we insist on mediating the quality in art so that children and youths have alternatives to choose the quality of them life: it is important to provide children and youths with some quality art in order to give them a chance to be moved by their

⁷ https://www.teachingartists.com/whatisaTeachingArtists.htm

experience. As those who are passionate about art know, art can fundamentally change your life. If the child can experiment major sublime artistic experiences, this can change the course of life. When children are in close contact with art and culture in everyday life, they have a better chance to develop several important competences both in relation to their personal development and in order to be able to participate in active way in democratic society as competent citizens.

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Competence Based Curriculum for Skills Development through Dual Training: Evidence from Eastlands College of Technology

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Abstract

This research paper will address the issue of "Education for What" in the context of vocational and technical training by presenting the evidence from the Dual Training System (DTS) adopted by Eastlands College of Technology & St Kizito VTI in conjunction with Simba Colt Motors and other players of the motor vehicle industry. The Dual Training System is the educational model followed by Germany and some other Central European Countries that combines the classroom and on job training. The Vocational Training Institution and the Workshop in the Industry are two places of learning.

DTS motivates the youth to take up vocational education enthusiastically, gives the resources to the students and the colleges to finance the training and what is more important provides the industry with trained manpower that fits its needs. Data collected from interviews and questionnaires administered to the stakeholders (college, industry, student, parents and policy making bodies) will be analyzed. The results of the data will help benchmark the local adaptation of DTS with the traditional implementation in Europe.

The paper recommends to adopt the Dual Training System as one of the methods to teach Competency Based vocational training to prepare manpower for the industrial growth of the country. It also provides the resources needed to finance the training by involving all the stakeholders of the vocational education.

Keywords: Dual Training/Kenya, TVET

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1.0 Introduction

Aristotle analyses in the Nichomachean ethics has mentioned five ways in which the soul arrives at truth "...virtue of which the soul possess the truth by way of affirmation or denial are five in number, ie. Art, scientific knowledge, practical wisdom, philosophical wisdom, intuitive reason....."(NE, 1139b-1141a). The five ways in which the soul arrives at the truth are; pure science (episteme), art or applied science (techne/ technique, skill, art, applied science), prudence or practical wisdom (phronesis/intelligence pertaining to action), intelligence or intuition (nous/understanding) and wisdom (Sophia - theoretical wisdom). Similarly in the Metaphysics Aristotle says that theoretical kinds of knowledge because they deal with the first causes and the principles of things. Aristotle further says in his metaphysics that theoretical knowledge is more of the nature of wisdom that the productive or practical kind of knowledge (Metaphysics 993b). One of the earliest known description of technical (vocational) education is the training of the hand (Magnus, 1881).

Huxley in 1885 lamented that "....*it passes the wit of man to give a legal definition of technical education*..." The Webster dictionary (1993) defines Vocational education as a training for a specific vocation in industry or agriculture or trade. Vocational education has been conceived of being unworthy of the elite and more suited to the oppressed or unprivileged classes (Lewis, 1991). This view of vocational education is prevalent in Kenya due to a colonial mindset inherited from the colonial times that white color jobs were for whites and technical education for Africans. It is unfortunate that this view dominates the Kenyan view on Vocational Education.

The dualistic view and dichotomized divide between theory and practice has been criticized by many researchers among them Goodson (1996), Allan (2007), Berglund (2009) and Bengtsson (1995) as quoted by Nina (n.d). At the same time there have been different suggestions on methods to be used to bridge the gap between theory and practice (Tempelman & Pilot, 2010). Technical education is practical in comparison to university education which is more theoretical/academic (Williams, 1963). UNESCO (1997) distinguishes between general education which it says leads participants to a deeper understanding of a subject and vocational educational or technical education which mainly is meant to lead participants to acquire practical skills necessary for employment in a particular trade or occupations. In Politics Aristotle contrasted the training suitable for artisans, slaves and women and education appropriate for free men (Politics, 1260a12-14).

1.1 Vocational education and work

Aristotle says in Nichomachean Ethics that ".....all knowledge and every pursuit aims at some good...... it is true that a certain variety is to be observed among the ends....."(NE, 1094a1-3).

According to Silver and Brennan (1988), education and training, theory and practice, the liberal and vocational have been polarities for centuries of turbulent history, they date

back to ideas about knowledge and education originally expressed by Plato and Aristotle. Recent formulation is based on the development of compulsory schooling when societies were in industrial revolution stage and the conceptions of work, labour and production were shaped by popular consciousness (Hyland, 1999). The distinctions between work and labour have played role in the determining the value surrounding different notions of vocational learning (Hyland, 1999). There is no genuine work that is lesser than another, "……all professional work demands previous training and constant effort to improve one's formation and adapt it to the new circumstances that may arise……" (Josemaria Escriva, Conversations, 90).

The concept of productive work linked to vocationalizing through applied knowledge may have contributed to the subordinate status of the Vocational Education and Training (white, 1997). There is a hierarchical curriculum differences linked to social stratification in which disinterested knowledge came to be associated with leisure elite and applied knowledge with the mass of people who had to work for a living (Shoefield, 1972). Dewey attempted to break down the antithesis of vocational and cultural education based on the false opposition of labour and leisure, theory and practice, body and mind (Dewey, 1916). Professional work, whatever it is, becomes a lamp to enlighten your colleagues and friends (Josemaria Escriva, Friends of God, 61). Further he says that any honest human work whether it is intellectual or manual if done with the greatest perfection possible (professional competence) no matter how insignificant it may seem to be helps to shape the world (Josemaria Escriva, Conversations, 10).

2.0 Skills development

Statistics from the World Economic forum (2016) show that on an overall basis, the world has developed 62% of its human capital in terms of skills development. Countries on average are wasting 38% of their human capital. Only 25% of the countries have topped 70% of their people's human capacity, 50% of the countries score between 60% and 70%, 41 countries score 50% and 60%, 14% of the countries remain below 50%. A successful entrepreneur in the informal sector may have no formal education, but a set of skills to perform various tasks. Therefore skills development is very important for any economy especially for people in the informal sector.

Improving Human Capital in Africa has become a major concern for researchers and policy makers (Shuaibu and Oladayo, 2016). Africa's population is bound to double in a generation, 60% of Africa's population comprise of the youth, Africa has the youngest population in the world; they comprise 60% of the unemployed. To be competitive, Africa has to make right long-term investments in education and health (World Bank, 2017). Having an increasing young population in Africa should not be seen as a weakness but as a strength in terms of human capital if the population is well trained in skills.

Africa will reap the demographic dividends if proper polices are implemented to increase the human capital index of the youth. For Africa to develop, there is need to cater for the huge youth population (200 million) and the enormous skills deficit. What Africa needs more is not more university graduates but graduates with the right skills for the changing market. To meet the needs of the youth, the education system need to focus more on developing skills that are needed in the job market and on a storing public-private partnerships (World Bank, 2017)

To meet the needs of the youth, the education system need to focus more on developing skills that are needed in the job market and on a storing public-private partnerships (World Bank, 2017). Walther (2013) observes that studies on existing formal training systems in developing countries have clearly demonstrated that the training policy and provisions is mostly failing to meet the needs of the young people in informal employment. Skills are applied to tasks to produce output; skills on their own do not directly produce output.

Skills development is a major contributor to social cohesion and inclusion. Efficient policies are important not only from a social point of view but also from an economic point of view. Inadequate education and training, poor skills, low productivity jobs and low wages can trap and exclude the poorest and most vulnerable groups of the working population (UNESCO, ITC and ILO, 2011). Skills are malleable; they can be developed through practice and reinforced through daily experiences it is possible to change diverging trajectories over the course of a lifetime (OECD, 2015). It is possible to change to other skills or acquire others over the course of a lifetime.

3.0 Skill development policy in Kenya

In Kenya the percentage of TVET enrolment as a share of total enrolment has declined consistently (Nicolai et al, 2014). The presidential committee on unemployment; the Wanjigi Report (1982) and The Presidential Working Party on Education and Manpower Training for the Next Decade and beyond (1988) envisaged technical and vocational education with specific emphasis on a foundation on vocational and entrepreneurial skills. Three factors are identified in the 1979-83-development plan of school leaver unemployment; the rate of school leavers output, unrealistic ambitions among school leavers for higher job placements and inappropriate skills among school leavers for medium range jobs (Republic of Kenya, 1979). Youth Polytechnics and Vocational Training Centres are the main institutions where the youth in Kenya get vocational skills training (Momanyi, 2014).

Skills development in Kenya is important for economic development; poverty alleviation and social inclusion in order to achieve Education for All (EFA) and the targets of Millennium Development Goals (MDGs). Session paper 10 of 1956 envisaged Growth in numbers of skilled, trained and experienced manpower, the paper envisioned provision of quality education and training at all levels. At the same time the Kenyan Government committed itself to eradicate ignorance, poverty and disease. Thus, education system has increasingly turned out large number of school leavers over the years at all levels who are not able to obtain gainful employment in the formal sector and thus end up in the informal sector (Momanyi, 2008). A report by UNDP and the Ministry of Youth and Sports (2012) found out that both employers, graduates and trainees agree on the most significant skill gaps among the youth, however most graduates from Vocational Training Centres and Youth Polytechnics and out of school youth are unable to use modern machines, trade knowledge and practical industrial exposure in that order. Therefore there is need to adopt a competence based curriculum to address this issue. The UND/Ministry of Youth and sports research notes that Prior to 2007/08, the Youth Programame sector was not properly linked with the rest of the education and training system in Kenya as envisaged in the Sessional Paper No. 1 of 2005.

According to UNDP and ministry of sports and youth affairs (2012), in Kenya out of the 14 million youth only39% are absorbed into the job market and the remaining 61% remain jobless, a majority live in rural areas. Those who migrate to towns end up staying in slums due to limited opportunities. The Kenya vision 2030 sees the youth as the bedrock to transform the requisite human resource skills for technological and industrial transformation to increase wealth creation and social wellbeing (Republic of Kenya, 2009).

3.0 Competence based education

The use of the 'concept' first occurs in the work of Plato (Lysis 2I5 A., 380 BC), In the Plato's death of Socrates, Socrates answers Miletus by saying ".....you say I teach spiritual concepts and believe in strange divine beings...." the concept also appears in the 'Code of Hammurabi' (1792–1750 BC) also mentions a comparable concept within the 'Epilogue' Competence appears in the Latin language in the form of 'Competens', which was conceived of as being able and allowed by law/regulation, and in the form of 'Competency is the individual's ability to use, apply and demonstrate a group of related awareness, knowledge, skills and attitudes in order to perform tasks and duties successfully as assessed against provided evidences at work location (Wahba, n.d). Spencer and Spencer (1993), define competency as internal characteristic of an individual that produces effective and superior performance.

Competence based education in vocational education and training system is a leading development for innovation on different levels of the school organization (Wesslsink et al, 2003). The popularity of a competence based curriculum is because of its positive side on education and learning, it makes individuals more competent instead of emphasizing their knowledge deficits (Wesselink et al, 2003) and the expected gap between the labour market and the school system (Klink and Hendriks, 2003). Some descriptions of a competency based education describe it in terms of behavior and others in more holistic character (Biemans, et al, 2003). I the behaviourist approach, is characterized by discrete behaviours associated with completion of atomized tasks (Gonczi, 1994). Competencies' described in behavioristic way cannot provide guidelines for an educational curriculum because of the detailed level of description, at this level competencies are reduced to mere human action (Barnet, 1994). The generic approach is a comparison between average workers and excellent workers, it is criticized as being unsuitable for education

since learners have to learn competencies in specific situations and develop the capability to apply them into other situations.

The holistic approach which is seen as a whole of knowledge, capabilities, skills and attitudes displayed in a context in with appropriate generality or holism by Hodkinson and Issit (1995), they say that this approach focuses on the development to f capabilities of students in relation to to professional practice. Competencies are seen as capabilities (Wesslink et al, 2003), according to Mulder (2000) a competence is the integrated performance-oriented capability of a person or an organization to reach specific achievements. Mulder further says that these capabilities can either be cognitive, interactive, affective, psychomotric, attitudes, and values which are conditional in carrying out a task. In a competence-based educational programme the aim is to contribute to the students' professional identity development. Students who finish their educational programmes should be better prepared to work in professional practice and participate in society as a whole (Jenewein et al. 2002).

3.1 Vocational education

So the main important objective of vocational training is to produce skilled workers with flexible qualifications (Manuel, nd). Skill systems and VET regimes have attracted increasing attention in comparative political economy of late (Culpepper et al, 2007). This is one of the main reasons why vocational training regimes are strongly linked to the development of national political economies and have historically developed in line with the development of other key labour-market institutions and organizations (Thelen and Busemeyer, 2008). Pring (2007) has pointed out the false dichotomy between general education (academic) and vocational (practical) education, and the low value attached to vocational education. One of the earliest descriptions of 'technical instruction' is as the training of the hand, which is contrasted with the education of the mind (Magnus, 1881).

3.2 Competence in the development of vocational education

Competence-based education has become a dominant trend in vocational education and training (VET) in several countries due to the expected decrease of problems in the transition from school to work Misbah, (2012) quoting Biemans et. al., 2004; Wesselink et. al, 2007; Biemans et. al 2009).

The concept of competence becomes the basis of the redesign of TEV (Misbah, 2012). The notion of competence entered the public domain in the 1970s with the debate around the recognition of the competencies of unskilled and semi-skilled workers (Dupray et al 2003). In the competence based vocational education, learning takes place in real life work place and business processes, the skills imparted are the skills required in the labour market. The learning outcomes describe what somebody knows, understands, and is capable of doing upon completion of a learning process based on the competence to be acquired (Weber et al, 2015). Provision of competence-based education is founded on a strong connectivity between what occurs in educational institutions and the work place setting (Wesselink et al., 2007)

3.3The European concept of VET

All over Europe and in the world Vocational Education and Training (VET) is in transition as led by the labour market; circumstances, conditions and measures affecting VET are varied according to continent and countries (Modláné, 2015). In the recent decades the concept of competence has been used for the development of vocational education and training majorly due to its popularity within, and also outside, the European Union (Mulder et al, 2007). Europe, the European Union member countries all represent different VET (Vocational and Technical Education) and labour market traditions, they have different meanings to the principles and concepts underpinning VET. This is the case, even where countries adopt seemingly similar systems, such as those based on competences (Mulder et al, 2007). Competence based VET system usually denotes functional employability (Brockmann et al 2008). In Europe, schoolbased VET route does not prepare students for formal employment, it all does not contain workplace element (Pring, 2007).

Within the literature on institutional change in collectivist training systems, one finding is that According to Thelen 2007, collectivist training regimes exhibit a high degree of stability as vocational education and training. Collectivist training show three kinds of rules; procedures and practices that sustain them as an institution: first, employers and their associations are heavily involved in the administration and financing of training; second, the systems provide portable, certified occupational skills (Thelen & Busemeyer 2008); and third, historically, employers' interest in skills may lead to training regimes that evolve as 'dual' schemes. Dual schemes combine school-based learning with company-based training. In particular, the coordination between employers and the provision of occupational skills whose content and quality are monitored and standardized by coordination greatly distinguish collectivist skill systems from segment list skill systems, which are associated with the provision of firm-specific skills and less coordination across companies (Thelen & Busemeyer 2008).

3.4 Dual Training System (DTS)

Dual vocational education and training takes place in at least two places of learning i.e. on the job, in particular at the workplace in a company and off the job, in particular at a VET school and in VET centers (Manuel, n.d). The Dual training is a system in VET where the responsibilities and costs are shared by the state and the economy, by acknowledging joint interests (Modláné, 2015). DTS is a training methodology which combines theoretical and practical training. It is called "dual" because the training takes place in two venues – the vocational school and in the workshop of the company. Vocational education and training within the school system besides the provisions of the vocational and examination requirements is based on the vocational training framework syllabus issued for the given school type and qualification (Modláné, 2015). The student spends over 70% of the training time in the industry working in real life working environment and producing for the company (ECT, 2017). The dual vocational training has two pillars: education in schools and practical training organized by enterprises and

other organizations. The goal of dual training system is to strengthen class learning and the world of bussiness by promoting high quality practical training based on apprenticeship contracts (Modláné, 2015).

3.4.1 The characteristics of the system in countries operating dual vocational education and training systems?

- 1. Vocational education and training functions as a service, the aim of which is to fulfil the labour market needs of a successful economy, and to provide career opportunities for a young, skilled workforce.
- 2. The aim of training skilled workers is not the acquisition of lexical knowledge, but to train successful and efficient employees.
- 3. As for enterprises the main motivating force is not short-time profit making, but high level training of the future employee, which is considered an investment with a long-term return.
- 4. As the vocation is being learnt in the course of work, the chances of an employee to find a job increase significantly, while the employer can minimize the costs of training and wrong employment.
- 5. Training in the school workshop prepares for practice at the firm, however everybody has to take part in external practice in a life-like situation.

Adopted from Hungarian Chamber of Commerce and Industry (Modláné, 2015),

The main objective of vocational training is to produce skilled workers with flexible qualifications, therefore vocational training within the dual system is oriented to this aim (Manuel, n.d). The DTS program embodies a strong cooperation between training institutions and the company and aims to benefit both parties and the student. Training institutions send the student-trainees to the company for *in-plant* training and exposure. The company makes good use of their skills and potentials by assigning the jobs where they learn and be productive at the same time (ECT, 2017).

Dual Vocational Education and Training is a success story, the system contributes to the national economy and society with strong SME competitiveness on international markets, low youth unemployment rates and a high employment security for skilled workers in comparison to unskilled workers (Manuel, n.d).

The company, as a DTS partner, pays stipends to the trainees since they are as a matter of fact like an employee. The in-plant-training duration takes most of the training time. Throughout this period, the student-trainees will acquire relevant knowledge and skills as their training progresses and as they become more productive. Thus, they contribute productively to the company's competent workforce. The learning progress of the trainee is tracked using a logbook. This is a document that outlines all learning outcomes, roles of the student, workshop manager and the Industrial coordinator from the training institution. The logbook ensures that the student covers the syllabus while delivering on the tasks at the workshop simultaneously. It acts as a feedback mechanism between the

industry and the training institution (ECT, 2017). The dual vocational training system was first implemented in Germany and Austria. These countries have the lowest youth unemployment rate today in Europe (Manuel, n.d).

3.4.2 Pilot DTS Programme in Kenya

In 2016, the Eastlands College of Technology and St. Kizito Vocational Training Institute in partnership with Simba Corporation Limited (Simba Corp) and Handwerkskammer Frankfurt-Rhein-Main (Chamber of Skilled Crafts) rolled out a unique Automotive Training Programme aimed at equipping qualifying students with the necessary skills to meet the growing need in the automotive industry. The programme was precipitated by the technological advancements experienced in the recent past that has greatly impacted the global motor vehicle industry and has in its wake, resulted in development of motor vehicle models that are more dependent on technology than was the case a few years ago. Having identified this need, the parties developed an industry driven syllabus that will in the end meet the rising demand for technicians possessing the skills required to meet the growing needs and emerging industry trends.

In addition to this, the parties initiated and rolled out a Dual Training aspect in the programme. Being the first of its kind in the motor industry, it gives the continuing students the opportunity to gain industry experience and on-the-job training through periodic apprenticeships. Currently, the programme is structured such that the industrial attachment is undertaken in between each of the three semesters over the 1.5-year course duration. There are two courses on offer: Automotive Technology and Automobile Body Works Technology, presented in three levels (Grade III, II and I) and examined by National Industrial Training Authority (NITA) at the end of each level. The program targets both girls and boys and education financing options are available to those from marginalized backgrounds through in-house arrangements with HELB. The students in this pilot programme have already done grade III examinations offered by NITA. Other than DTS in Automotive, the training partners have plans to roll out the training model to other courses i.e. Construction sector (Welding, Fabrication, Electrical Wireman, Plumbing), Hospitality (Catering, hair dressing and beauty etc.) among others.

4.0 Eastlands College of Technology

Eastlands College of Technology is sponsored by Strathmore Educational Trust as a Charitable Public Trust that holds property and is responsible for the administration of several educational institutions. Strathmore Educational Trust sponsors Strathmore College (1961)/Strathmore University (2002), Strathmore School and Eastlands College of Technology (ECT) (2013). The college implements an educational model that meets the real needs of Kenya's formal and informal sectors. It caters for the formal sector by creating permanent linkages with the corporations through the implementation of the Dual Training System (DTS) in Motor Vehicle Engineering, Electrical and Electronics Installation Systems, Industrial Maintenance, Electro-Mechanics and Specialized Welding Course. The college also caters for the Informal Sector by up skilling the already practicing apprentices to be able to run businesses better. The philosophy of the

college is in line with Government Strategies to attain poverty alleviation and economic growth under the Vision 2030. The need for improved technical skills training and better accordance of the training provided with the needs of the private sector.

4.1 Partners in ECT's Dual Training System

(i) Simba Corporation

Simba Corporation is a leading regional corporation with diversified interests in automotive and power distribution, services and solutions, as well as in real estate and hospitality. Founded in 1948 by the late Mr. Abdul Karim Popat as a modest used-car selling enterprise, the company is headquartered in Nairobi, Kenya and has grown to a large integrated multi-sector business group representing international brands and franchises such as Mitsubishi, Fuso, BMW, Mahindra, Renault, AVIS, SAME tractors, AKSA and GE generators. The company's Corporate Social Investment mission is "*To provide a platform to underprivileged youth by equipping them with technical and business skills*".

(ii) Handwerkskammer Frankfurt-Rhein-Main (Chamber of Skilled Crafts)

The Handwerkskammer Frankfurt-Rhein-Main is one of the German Chambers of Skilled Crafts in Germany with the mandate of providing practical training within the German dual vocational education and training system as well as giving consultation and expertise to small and medium enterprises in the crafts sector. Together with the Chamber of Industry & Commerce Giessen-Friedberg implements a partnership project with the following partner organizations in Kenya: Kenya Private Sector Alliance (KEPSA), Kenya Association of Technical Training Institutions (KATTI) and Kenya Federation of Master Builders (KFMB) and Strathmore Educational Trust. The project aims at introducing a more demand and practice-oriented vocational training to improve the employability of young people in Kenya.

ECI					
Course	Jan 17	May 17	Sep 17		
NITA III	36	22	26		
NITA II	29	0	27		
NITA I	0	0	17		
DIPLOMA	0	0	17		
TOTAL	65	22	90		

Table 4.1 Total number of students undertaking the dual training programme at FCT

		Admission	No. of students attached
1	August 2016	30	30
3	January 2017	33	27
4	May 2017	22	18
5	September 2017	28	

Table 4.2	ECT	intakes	in	Motor	V	ehicle	Engin	eering
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Table 4.3 Companies that participated in the DTS and number of students who have completed industrial attachment

		No. of students	No. of months spent at firm
1	Oriel	8	6
3	Auto Xpress	21	3
4	Simba Corp	17	6
5	Daivine	9	6
6	Super touch	4	3
7	Autofine	12	6
8	Jacaranda Motors	2	3
9	Express Connections	6	6

Table 4.2 ECT Students on industrial attachment

		No. of students	No. of months into the attachment
1	Oriel	2	2
3	Auto Xpress	8	2
4	Simba Corp	0	2
5	Subaru kenya	1	2
6	Daivine	2	2
7	Super touch	2	2
8	Autofine	3	2
9	Jacaranda Motors	0	
1	Express Connections	0	
0			

The ages of the students

Range	Number	
15-20	7	
21-25	16	
26-30	1	
31-35	0	

Student responses	Yes	%	No	%
Got Orientation before starting placement	23	29.11	1	1.27
Received some stipend during placement	20	25.32	4	5.06
Visited by instructors for assessment	24	30.38	0	0.00
Filled in logbook on a daily basis	19	24.05	5	6.33
given placement assessment result	13	16.46	10	12.66
Competencies improved during placement	22	27.85	2	2.53
Learnt how to operate various machines	23	29.11	1	1.27
Placement experience helped to network	22	27.85	2	2.53
gotten offers for employment	11	13.92	`13	16.46

Student responses	Yes	%
wheel alignment machine	5	6.31
spring compressing machine	3	3.78
Diagnostic machine	7	8.86
arc welding machine	1	1.27
spot welding machine	2	2.53
Mapping	1	1.27
Tyre changer	1	1.27
None	5	6.31

Companies in discussions to join ECT's Dual Training System include:

- i. GM (Isuzu EA),
- ii. DT Dobie,
- iii. Stantech Motors,
- iv. Toyota EA.

Recommendation

In Kenya there are many challenges in vocational training. More challenges continue to arise in the vocational skills training, more challenges may arise in implementing a dual training system; there is ignorance of this system of training besides the ignorance of training centers of the reality of the Kenyan productive market and its needs of specialization. There may be a rigidity in adapting to this system and lack of uniformity in the various models of dual vocational training cycles which may be implemented. There is a general lack of recognition of apprenticeships, some firms may initially refuse

to take in interns. There has to be a curriculum to guide the time that an intern should be in the company and school for various vocational courses. There should not exist different dual formats in the framework of the same training involving the private sector, government and all stakeholders in the skills training programme.

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