

**COLLABORATIVE INFORMATION SEEKING BEHAVIOUR OF STUDENT
GROUPS IN VOCATIONAL EDUCATION TRAINING INSTITUTIONS IN
ZANZIBAR**

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Abstract

This study investigated collaborative information seeking behaviour of student groups at Vocational Education Training Institutions in Tanzania. Specifically, it sought to find out student group information needs and sources they use to meet their information needs. The study was conducted at Amali Pemba and Amali Zanzibar, and involved observation of two student groups namely tailoring students whose collaborative task was servicing of sewing machine (Amali Pemba) and electronics students whose collaborative task was of repairing a television set (Amali Zanzibar). Data were collected through observations, interviews and Focus Group Discussions. Data collected was qualitatively analysed using thematic analysis techniques. Key findings revealed a wide range of varying student group information needs pursuing two courses, which varied according to tools and type of task assigned to the group. Specifically, the student group servicing sewing machines needed information on sewing machine servicing steps and procedures, and tools to use, and the group responsible for repairing a television set needed information on television faults and how to fix them. Findings further revealed that in order to meet individual group information needs, both students groups relied largely on group members and teachers. Other sources consulted were search engines, internet, and colleagues outside the team or group. The lack of libraries and computers connected to the Internet negatively affected group information seeking and successful accomplishment of group tasks. It was also revealed that respondents were not aware of collaborative search tools which could have enabled users' to communicate and collaborate synchronously during the information seeking and retrieval. In view of the above, this study recommends that libraries with internet connectivity should be established in all VET institutions, to enable students to access information they need. Furthermore, awareness should be created on collaborative search tools and software and hardware should be acquired to support CIS.

Keywords: Collaborative Information Seeking Behaviour, Vocational Education Training Institutions (VETs), Zanzibar.



Introduction

Vocational Education and Training (VET) was designed to prepare individuals for a vocational or a specialised occupation and so it is directly linked to a nation's productivity and competitiveness. The economic crisis experienced globally resulted in failure of many sub-Saharan African countries to absorb the growing labour market (Mshoro, 2010), in a continent which had already experienced unprecedented demographic youth bulge. In such situations, VET institutions play major role in rescuing unemployment, through imparting technical skills to artisans and micro-entrepreneurs, and by attracting income generating activities (Durango, 2002). Furthermore, with increasing economic hardships and expansion of the informal sector, technical education and skills offered by VET institutions provide opportunities not only for the unemployed, but also for those who are formally employed, in both urban and rural areas.

Collaboration is an important ingredient associated with student group task accomplishment in VET institutions, stresses the value of collaboration as a useful and essential tool for undertaking any difficult task. By nature human beings do collaborate in activities that cannot be done by a single individual. Moreover, successful accomplishment of group tasks requires manipulation of information collaboratively as they engage in the identification of group information needs, searching through documents, people, and using information in accomplishing group tasks (Fidel, 2003). Through collaborative information-seeking group pairs can bring together more diverse information, and can critically evaluate information to make better decisions for better results (Golovchinsky & Pickens, 2011). Yue and He (2010) assert that collaborative information-seeking **ligates** the accomplishment of group tasks more efficiently. Researchers have recently began to examine the particulars of collaborative information seeking behaviour (CISB) to identify barriers in order to start planning better procedures and tools to facilitate students collaborative information seeking when working in groups (Foster, 2010; Jansen, 2009; Hansen and Jarvelin, 2005).

In Mainland Tanzania and Zanzibar, VET institution/centres are found in almost all regions and districts (URT, 2014). Their purpose is to develop Competence-Based Education and Training (CBET), these efforts are aimed at producing competitive and high quality products, increase efficiency and reduce production costs while fostering innovation. The introduction of CBET, along with Competent-Based Assessment (CBA) significantly impacted the VET system in Tanzania and encouraged students to work collaboratively in groups (Kafyulilo et al., 2012). As CBET took hold, VET students' information-seeking was expected to become collaborative rather than individualistic, that is, VET students had to collaborate during searching, synthesizing and sharing information, and trigger communication in within the wider group setting information-seeking process.

Even though students in VET institutions engage in group tasks, however, information systems to support collaborative information seeking in those institutions are inadequate. This inadequacy in support infrastructure denies students the ability to seek, share and use information collaboratively, and impacts the quality of their learning (Shah, 2008; Draycott & Rae, 2010). Studies on collaborative information seeking revealed that team-level; organisational technological and individual-level barriers are major challenges constraining

effective collaborative information seeking in developing countries (Draycott & Rae, 2010).

Studies on CIS have not adequately covered academic or technical institutions, particularly in developing countries including Tanzania, where the level of collaboration in undertaking assigned tasks and seeking information is high due to the nature of their technical tasks (Foster, 2010 and Toze, 2014).

Studies in the context of developing countries (Maro, 2002; Msuya, 2003; Elia, 2006; Malekani, 2006; Lwoga & Ngulube, 2010 and Luambano, 2013) focus mostly on individual students' information seeking behavior. Consequently, the conceptualizations that underlie information seeking behavior and information retrieval systems in these studies are mainly viewed from an individual user's perspective, despite mounting evidence that suggests that group-based collaborative information seeking plays an important role in organisational work (Foster, 2010). The sole focus on individual information seeking has led to the promotion of information systems and search processes oriented towards individual information seeking and often constrain collaborative information seeking.

The few studies on CIS in the context of developing countries focus on students enrolled in higher learning institutions (Ndumbaro, 2016) as opposed to technical institutions which require students to accomplish collaborative tasks, as stipulated under CBET and CBA.

In view of this, it was deemed important to investigate CISB of VET students to assist information professionals in developing information systems that support collaborative information seeking in VET institutions.

Development of Technical VETs Globally, in Sub-Saharan Africa and Tanzania

According to Wolf-Dietrich (2004), Technical and Vocational Education Training (TVET's) worldwide followed the same pattern of apprenticeship through trade guides of Europe. In Europe, the TVET's emerged between the 18th and 19th century, a trend closely associated with the Industrial Revolution and the disappearance of the traineeship systems that were guided by the European systems, notably from about 1760 to 1840's (UNESCO, 2012). Therefore, Technical and Vocational Education Training established in schools and colleges provided support by investing in manufacturing factories (Wolf-Dietrich, 2004).

Ajithkumar (2016) asserts that Technical and Vocational Education Training in developed countries such as USA, Germany, Canada, Australia and United Kingdom (UK) was planned to play two vital social economic and environmental development roles in these countries, 12). From the socio-economic point of view, TVET's role was to provide training opportunities and career advancement including training of skilled human resources that were required in all industrial economy levels.

According to Geitz and Jurgen (1995), by the second half of the 19th century vocational education was already established in American high schools, and in the early 20th century, efforts were made to imitate the new TVET system i.e. the German industrial education style (Wolf-Dietrich, 2004). The new vocational system in the United States included

additional courses such as home economics, wood and metal shop, typing, business courses, drafting and auto repairs

According to Wolf-Dietrich (2004), the historical development of Vocational Education and Training (VET's) in developed countries differed widely due to social characteristics of each nation, with each country having its own VET's system, in response to the major global innovations and technical challenges. However, by mid-2000, developed countries had well established coherent TVET' pathways for further education and as a base for self-employment.

According to Mshoro (2010), most countries in sub-Saharan Africa were experiencing an unprecedented demographic youth bulge (increased youth demographic growth)during global economic crisis implying a limited capacity to absorb the growth of the labour market. Given such a situation, VET institutions rescued the unemployment situation, and, according to Atchoarena & Delluc (2002), VET's curricula in those countries combined both entrepreneurial and technical skills acquired in formal and traditional apprenticeship systems. According to Durango (2002), most VET's programmes in developing countries are desined o strengthen technical skills of artisans and micro-entrepreneurs and to attract income generating activities . UNESCO (2012) points out that vocational training centres, specifically in Botswana, Namibia, Lesotho and Ivory Coast were set up in collaboration with special Commonwealth Assistance Programme to educate artisans and administrative staff for the new civil service to maintain their indigenous knowledge onto technical practices.

since the late 1980,theonomic situation in Africa and Tanzania in particular, has been characterised by a weak economy coupled with soaring unemployment. According to Rugumyamheto (2000), during the 1990s many workers in public organisations were retrenched and many were left unemployed, particularly in urban areas. Since then unemployment has been increasing 11 despite the expansion of education opportunities. Following drastic economic changes, the Tanzania government was no longer the main employer because the private sector took the lion's share in job creation and employment (URT, 2010). Concsquently,, VET institutions significantly increased their efforts at providing technical education and the necessary skills, and thus fostering efficiency in informal sectors (Mutarabukwa, 2007). VET centres, therefore, provided opportunities for peopleboth formally employed or unemployed in both urban and rural areas to acquire new kills to improve economic production. For the unemployed, the acquisition of technical skills inreased new employment opportunities or allowed them to be productively self-employed. According to Ishumi (1998) from the late1990s, a major review was undertaken to find out how the VET systems could be adjusted to meet the new needs of a drastically changed operational environment, and in consequence, VET tried to bridge the unemployment gap.

However, the VET system in Tanzania had some apparent weaknesses (Ishumi, 1998). For example, VET training centres were isolated from the industrial sector they were supposed to serve, this is because the , the VET curriculum was not in harmony with labour market demands (Kihindi, 1996). Another weakness was the National Vocational Education Training Centre (NVETC) new policy which introduced a four cycle training system. The

four cycle traineeship system was not well-operated due to inadequate funding from the Government-or parent body.

To overcome these weaknesses and in order to improve the effectiveness of VET systems in Tanzania, the government overhauled the VETs training system (Kafyulilo et al., 2012), and developed a new VET system policy to guide its implementation and ensure equal opportunities to females and disadvantaged groups (Kihindi, 1996), and also established libraries in VET institutions.

The new Vocational Education and Training System, incorporated Competence Based Education and Training (CBET) aimed at producing competitive and high quality products, increased efficiency and reducing production costs while fostering innovation (Ishumi, 1998). In other words, it encouraged collaborative learning and engagement on group-based problem solving (Kafyulilo et al., 2012; Solomon, 2016).

Factors Promoting Group Information Seeking among Students

In collective situations, it is common to collaborate. According to Hansen and Jarvelin (2005) collaborative information retrieval activities involve document-based related seeking behaviour and human communication related seeking behaviour. These events happen throughout specific process group tasks which cut across gender, age, culture and other differences. Collaborative information seeking is triggered by various factors which play an important role in that they change individual information seeking behaviour to collaborative information seeking. Various studies on collaboration in organisational settings have highlighted several factors that promote group collaborative information seeking among different agents. These studies argue that collaborative information behaviour influence how individuals interact to meet group information needs.

Reddy and Spence's (2008) study on collaborative search behaviour of multi-disciplinary teams in the context of medical care at the Centre for Clinical Research,Queens-land University identified four triggers of collaborative information seeking activities, namely lack of immediate access to information, complexity of information needs, lack of domain expertise and fragmented information resources. A study by Farmakopoulou (2002) revealed that the need to access resources and reduce costs is equally a motivating factor for individuals to collaborate. Budgetary constraints, especially in academic institutions necessitate sharing of limited resources while upholding high performance.

Bruce et. al., (2008) study compared collaborative information seeking behaviour between two design teams in the medical field. The findings revealed that patient-related information needs can be met by accessing multiple sources, making it imperative for the team of doctors to split information seeking tasks, with each member focusing on a particular piece of needed information. By working together in handling the complex task, they were able to put all the different components of the needed information to make an informed decision on how to treat patients. The findings also revealed that communication patterns and work activities influence the need for information and fosters collaboration during information seeking and sharing.

The same was confirmed by Saleh and Large (2012) who found out that perceived task complexity triggered group-based CIS activities. This perceived complexity was affected by students' prior knowledge and ambiguity of information, which forced them to approach people they considered as experts with better domain procedural knowledge, to

help them to become aware of information sources or guide them to alternative sources of project information considered useful .

A study by Punamäki & Wallenius (2009) investigated to what extent students seek information as individuals or as a group findings revealed that a majority of respondents work in groups on a project but seek information individually. Few respondents argued that complexity of group tasks, and are major factors driving collaborative seeking information, followed by project requirements to work as a team .

Likewise, Hansen and Jarvelin's (2005) study found that team members collaborate most when defining information problems (needs) and when developing strategies for information retrieval, but nevertheless, the retrieval act itself is generally carried out by individuals. Moreover, the findings revealed that creation of workers' awareness is a major factor for collaborative information seeking, and the need to be familiar with requisite procedures.

Fidel(2003) underscore a number of factors triggering individuals to seek information collaboratively, including lack of expertise in a specialised area or the need for tacit knowledge. Similarly, Reddy and Spence (2008) noted information traits as one of the factors promoting collaborative information seeking. The authors attribute this factor to lack of immediate information access or information ambiguity and the need to make informed organisational decisions .

Methodology

This study employed a qualitative research design. According to Kim (2013), most studies on collaborative information seeking employ observations and interviews, which are qualitative in nature.

This study was conducted in Zanzibar, and involved Amali Pemba and Amali Zanzibar. The selection and involvement of these institutions was based on the fact that both have adopted and implemented Competence-Based Education and Training (CBET) systems which require students undertake learning and practicals in collaborative environments. Zanzibar was involved because despite being an integral part of the United Republic of Tanzania, many studies conducted in Tanzania tend to cover Tanzania Mainland only, therefore in this study focusing on the archipelago was considered important.

The study population comprised VETs second year students and teaching staff. VETs students were included because they conduct various tasks collaboratively. Specifically, the inclusion of second year students was because they have more practical classes, as stipulated in Competency Based Assessment (CBA). Moreover, in their second year, they are also more involved in industrial training than other years. Teachers were included in the study because they instruct VET student groups by assigning them various tasks which require collaboration.

Data were collected through a combination of methods, namely observation and interviews, and Focus Group Discussions (FGDs). According to Kim (2013), observation and interview are implemented in many CIS studies to identify specific collaborative actions and practices, a view also supported by Reedy and Jansen (2008). In employing observation, the researchers used naturalistic observation where students groups were

observed in their natural working environments without manipulation by the observer. During this process the researcher interviewed the group/team leader, in a follow-up to observations. Face to face interviews were also conducted with subject teachers at both VET institutions. Focus Group Discussions were conducted with 12 second year students undertaking the same courses at each of the two VET institutions, observations were conducted, for the purpose of clarifying any issues noted during observations. Data collected was analysed using thematic analysis. Themes are patterns across data sets that are important to the description of a phenomenon and are associated with a specific research questions. The tool stresses pinpointing, examining, and recording patterns (or "themes") within data; the themes become categories for analysis.

Findings and Discussion

Group Information Needs of Tailoring Course Students

Tailoring course students at AMALI Pemba group task was servicing sewing machines. According to schedule, the four group members had to complete the group task within two hours. The researcher conducted observations while they were accomplishing group tasks, and also the group leader was interviewed during the session. Findings revealed that to accomplish the specific task of repairing sewing machines group members needed information on sewing machine servicing steps and procedures, as well as proper tools to use. During interview, the group leader commented:

"...the sewing machines in the workshop are very old they frequently need repairs....but VET institutions are facing budgetary constraints which make it difficult for the department to purchase new machines, access to information on how to repair available old machines is e the best way of rescuing the situation....and this is a must since there is Ino other option..."

Similarly, one respondent explained the high demand for information when he commented ;

".... since we are expected to be self-employed in the future, knowledge on machine maintenance and repair will enable us to cut down on running costs and help us to generate extra income through servicing sewing machines in other workshops.....Access to information on basic maintenance and machine repair can increase the machine's life span and minimize frequent breakdowns ..."

During an interview with the subject teacher it was revealed that generally, most sewing machines in use at the institution are old, and are subject to frequent break downs.

Sources Used by Tailoring Students to Meet Tailoring Information Needs

Findings revealed that to meet their information needs, students use various information sources, specifically group members, internet, colleagues outside the team, and subject teachers. Jensen (2009) asserts that circulating information within team members is the principal information-gathering strategy for successful c0mpletion of complex tasks. Shah (2008) affirms that group members can meet through formal and informal meetings/interactions, anywhere, at any time when members need information, especially when it is not easy to employ other information sources.

Another source used is colleagues outside the team, who know about proper servicing tools or where to find certain tools. Shah (2008) asserts that employing external human resources

(people outside the team) is an important strategy in collaborative information seeking. This was emphasized by one participant during Focus Group Discussion, who commented
“...external human information sources help our groups to clarify problems and to come up with possible solutions, and to locate reliable information sources...”

Communication with colleagues outside the team is through phone calls, since most group members have mobile phones. Other sources used are the Internet, which they access through mobile phones (smartphones) that are connected to Internet service providers. Even though Amali Pemba had a computer laboratory, but they only had a few computers which were not even connected to the Internet. This situation was further exacerbated by the lack of a library which is, an important establishment for providing access not only to books, but also to electronic resources through online access. Institutional access to computers with Internet connectivity is an important step in promoting successful completion of tasks, but more needs to be done to ensure real support to group rather than individual information seeking. A study by Krubu & Osawaru (2011) revealed that most computer laboratories in Nigeria are not well organised to support group work. They further argue that ineffective internet usage in academic institutions is associated with connectivity, rapid change of technology, the lack of skilled human resources and inadequate funding for staff training in technical skills.

Findings further revealed that group members often consult teachers to help them find information they need to complete tasks. Teachers are instructors and are responsible for curriculum development and its implementation. As such they are vital links in terms of connecting students to other sources of information that permit group members to explore different ideas, to synthesize a wide range of information sources in order to frame the solution of existing problems. The researcher also realised that technical vocational teachers are authorities on technical issues and they develop students' pedagogical and theoretical skills despite the difficult environment.

Additional findings from Focus Group Discussions (FGD) revealed that limited search skills and low level of awareness are major challenges facing students. These problems are largely attributed to lack of libraries and qualified librarians, Libraries stock books and also provide access to e-resources, while librarians train users on how to search and retrieve materials and they also create awareness on important learning resources or databases that users can access. Budgetary constraints are also major factors (Udoka, 2010); similarly, low priority accorded to library establishment especially in VET institutions is also an important factor.

Group Information Needs of Electronics Course Students

Electronics course students at AMALI Zanzibar group task was repairing a television set which failed to produce video or audio signals when connected to a power supply. According to the schedule, the six group members were required to complete the task within two hours. The researcher conducted observation, and interviewed the group leader during the session. Findings revealed that group members needed information on tv problems

As noted through observation and interview with the group leader, group members needed information on television faults and how to fix them before they could address the

problem. The same was revealed during Focus Group Discussions with students; however, it was also made clear that information need is largely determined by the type of task assigned to the group.

Sources used by Electronic Students to meet Group Information Needs

In their attempt to address their information need, group members consulted a number of sources, such as group members, teachers, colleagues outside the team, and search engines. However, despite exchanging ideas among group members on how to address the problem, they failed to diagnose or rectify the problem, and had to wait for the subject teacher who routinely monitored their progress as they continued to work on the group task. During interview, the group leader said the following:

“.....as you see we are six in the group and yet we have not been able to diagnose the problem. We may have to wait until the teacher comes avoid causing new problems to the television set ...”

While they were waiting for the teacher, they decided to use other sources. Using a smart phone, Onegroup members searched the internet for information on the Internet, using Google search engine. Although use of mobile devices increases access to the internet, there are cost implications for internet connectivity, in addition to the high cost of mobile devices which many students cannot afford. Nevertheless, the lack of internet search skills and awareness of relevant online resources was a major barrier, to effective retrieval of quality resources. While waiting for the teacher, they also asked other colleagues pursuing the same course, who might have the needed information and this was done through phone calls, since most students have mobile phones, especially the cheaper feature phones used mainly for making calls and sending text messages. They used it for communication purposes to facilitate task completion, the researcher noted that sometimes group members used it to seek appointment with teachers, and to receive or provide feedback from instructors and to download information to share and communicate to others. The finding corresponds with Huang and Hwang (2010) who pointed out that mobile phones assist student to solve technical problems. However, not all group members owned mobile phones, and therefore working in a group enables students working in groups to share information accessed equally benefits each group member.

However, before completing the phone call conversation, a colleague in the same course walked by and he gave them advice, which helped them to identify the real problem. However, the task could not be completed because replacement of one of internal TV spare part was mandatory, so the task was postponed to another day. Later when the teacher came, he agreed with the diagnosis, and urged them to complete servicing the TV set the following day after getting the needed spare part.

During a Focus Group Discussion which was conducted later, it was indicated that, student groups pursuing this course used other sources to meet their information needs, depending on type of group task and the amount of time set aside for completing the task. Such sources included lecture notes, training manuals and text books, which, often, are scarce due to the absence of a library at the VET institution, as well as

However, the researcher found out that students at both institutions are not aware of tools and systems that support collaborative information seeking; the same applied to teachers during interviews. One example of such tools is Multi User Search Engines (MUSE),

which, according to Krishnappa (2005), supports multiple users to communicate and collaborate synchronously during information seeking and retrieval in contrast to the single-user search engines that are available. Non-use of collaborative tools can be attributed to lack of a supportive infrastructure, but most important for this study is the low level of awareness among stakeholders on the concept of collaborative tools.

Conclusion

The findings revealed a diversity of information needs of student groups at the two VET institutions, depending on the type of course and type of activities performed or accomplished. However, they failed to meet their group information needs this resulted in completion delays, poor completion or even non-completion of group tasks. Although they worked and sought information collaboratively, the existing information systems did not support collaborative information seeking, or even individual information seeking, as noted earlier the absence of libraries, and computers with Internet connectivity for students. This means that a lot must needs to be done in terms of building a supportive infrastructure. The absence of a library denies students access to reading materials, and access to librarian's invaluable support, such as assisted searching and their knowledge of available relevant learning resources. The lack of access to the Internet has forced them to seek online information using mobile devices, which are also in affordable to most students, and requires high internet connectivity fees, not to mention their limited search skills and low level of awareness of relevant online resources. Therefore, there is a need to ensure that students at VET institutions get support they need to help them meet their information needs, both at individual and group levels, by establishing basic infrastructure such as libraries and computer laboratories with internet connectivity in all VET institutions, as well as awareness creation on the importance of CIS and tools that support it, the targeted should be policy makers, teachers and students. That framework would ultimately facilitate establishment of tools to support CIS in VET institutions.

Recommendations

Based on the study findings, the following are recommended:

- Awareness raising campaigns on collaborative information seeking and sharing tools should be carried out, targeting all VET stakeholders such as teaching staff, students, decision makers as well as librarians. Unless these categories are made aware, it might not be possible to give priority to establishment of collaborative information seeking and sharing systems. Awareness creation can be carried out through organising seminars and workshops, and should also focus on scholarly online resources relevant for technical institutions.
- The Government should make policy changes and make it mandatory for any VET institution, private or public that needs to be registered to have a computer laboratory and library and qualified librarians, emulating what TCU and NACTE do when registering universities and other higher learning institutions respectively. This would ensure existence of an improved environment that supports group information seeking.
- Computer laboratories should be established in all VET institutions and should be equipped with adequate and up to date computer hardware and software applications. to support collaborative information seeking and sharing in VET institutions throughout Tanzania, accompanied by vendor support and staff. Training on its use.
- Libraries should be established in all VETs in Tanzania, and should also be equipped with relevant and up-to-date reading materials, and should recruit trained and qualified

librarian who would ensure that reading materials are well organised and easily accessible to users and who would ensure users are aware of both traditional and online search tools. Establishment of libraries should go hand in hand with planning for automation.

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