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The influence of social learning environment on performance of students with physical disabilities in secondary schools, Tanzania

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Abstract: Literature acknowledges on the importance of social learning environment on the performance of learners at all levels. The study sought to determine the influence of social learning environment on performance of students with physical disabilities in secondary schools. The focus was on the influence of teacher-student and student-student interactions on the learning and performance of students with physical disabilities. The study area was Dodoma, the recent capital city of Tanzania. The research approach was quantitative, employing a multi-stage sample of 294 teachers and 33 students. A cross-sectional survey was used to collect data; and analysis was done through structural equation model. The findings indicate that teacher-student and student-student interactions have a significant positive impact on performance of students with physical disabilities. It is therefore recommended based on the findings for Tanzania's educational institutions to make adequate efforts to foster interactive teaching and learning.

Keywords: social learning environment; students performance; physical disabilities; secondary schools; SEM; structural equation modelling; students interactions; Tanzania.

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1 Introduction

The social learning environment avails students the opportunity to discuss their perspectives on various subject matters while listening to the viewpoints of others. According to Giannetto et al. (2013), Haegele and Sutherland (2015), and Raspopovic et al. (2017), social learning environment is a setting where students engage in collaborative production of knowledge through conversation, writing, and participation. The setting links students with their peers and teachers, and also supports learning activities both from within and outside the institutional structure. This argument makes it clear that learning (in terms of knowledge and skill acquisition and attitude development) is achievable in an engaging social (Giannetto et al., 2013). However, literature cautions that physical learner-learner and teacher-learner interactions are not panacea to teaching and learning. For instance, as Elvan and Eda (2023) note that the outbreak of COVID-19 pandemic in 2019 disrupted the teaching-learning environment by limiting physical teacher-student and student-student interaction, hence, compelling them to interact through the use of digital technology. Because of the sudden shift, students were particularly demotivated by the closure of schools and the transition from face-to-face interaction to technology-aided interaction; which in turn impelled the rate of learning and accomplishments to significantly slow down. Limited attention, a sense of laziness, loneliness, and lack of self-confidence have been sighted as attributable to students learning at a slower pace and consequently achieving little.

There have been numerous appeals made globally for all state governments to ensure that every individual living within their borders enjoys prosperity. These include the United Nations Convention on the Rights of Persons with Disabilities (CRPD) of 2007, which Tanzania signed in 2007 and ratified in 2009, and a more specific one – the sustainable development goal number 4 (SDG 4), which calls on all countries to guarantee inclusive and equitable quality education and encourage life-long education opportunities for all without discriminating against certain populations such as the people with disabilities, girls, or women through the slogan 'Leave no one behind' (UNESCO, 2022).

In order to operationalise SDG 4 in education therefore, Tanzania launched The National Strategy for Inclusive Education (NSIA) which was first implemented in the period spanning from 2009 to 2017 while its successor covered the period from 2018 to 2021 and the current National Strategy for Inclusive Education covers the period from 2021 to 2026. In addition, the Education Act of 1978 (as amended from time to time) and the Education Policy of 2014 provide for the right to education for all Tanzanians. All of these instruments are in harmony with the nation's development vision (Tanzania Development Vision 2000–2025), which seeks to use education as a strategic tool for

transforming citizens' mind-sets to create an educated society that is well-versed in the knowledge needed to competently address the nation's development challenges.

While Tanzania has made notable progress in the renovation of out dated facilities and construction of new ones to facilitate equitable education in the country, little is known about the impact of all these initiatives on the performance of SWPDs. In the present study, we depart from Kombe and Mwakasangula (2023) study on how physical school amenities affect SWPD performance to the influence of social interactions on the performance of SWPDs so as to gather context-specific evidence that will add into the growing literature in this field.

2 Objectives and hypotheses

In the current study, we aimed to evaluate the influence of the social learning environment on the academic performance of students with physical disabilities in selected secondary schools of Tanzania. Two objectives were specifically addressed and these were:

- 1 to assess the influence of teacher-student interaction on the performance of SWPDs
- 2 to assess the influence of student-SWPDs interaction on the performance of SWPDs in selected secondary schools.

The following hypotheses were postulated in line with the research objectives as follows:

- Ho There is no significant positive influence of teacher-student (SWPDs) interaction on performance of SWPDs in selected secondary schools
- H1 There is no significant positive influence of student-student (SWPDs) interaction on performance of SWPDs in selected secondary schools.

3 Theoretical framework

The social learning theory (SLT) and social perspective theory (SPT) put forward by Bandura (1961) serves as the foundation of the theoretical framework for this study. Both theories are rooted in Bandura's research on the learning environment from the 1960s. According to Bandura, learning and performance are influenced by observation and interaction with others. Interactions among individuals promote observational learning (Bandura, 1989). A modelling approach that includes variables including attention, retention, reproduction, and motivation is used to explain the process of observational learning.

The Social perspective theory originated from a reaction to the social cognitive learning theory. According to its underlying premise that learning occurs through the internalisation of social interactions, individuals connect with one another in order to disseminate knowledge (Vygotsky, 1979). Therefore, social learning environment enables learners to perform more effectively and comprehend more clearly. Teacher-student communication and student-student interaction are the two categories into which interactive learning can be classified (Tsai, 2017). It is widely acknowledged

that teacher-student interaction is vital and contributes to students' achievement at various levels.

According to Pervin et al. (2021), a student's level of interaction with their teachers has a major impact on how well they perform academically. This implies that students' performance increases with increased interaction with their teachers and the opposite is equally true. In order to develop beneficial relationships, it is also widely acknowledged that more trust among people encourages increased engagement. According to additional research (Roorda et al., 2011; Tsai, 2017; and Pervin et al., 2021), creation of a positive teacher-student relationship produces self-regulated learners who are motivated to study through active involvement.

Li and Yang (2021) propose that active teacher-student contact increases students' commitment to learning activities and self-efficacy. Students become active and optimistic because they are utterly engaged in the learning process. Students perform effectively both in the classroom and during extracurricular activities while enhancing their self-efficacy. According to existing literature, teacher-student interaction is essential for increasing motivation, fostering self-efficacy, boosting learners' confidence, and empowering them to become agents of their own development (Hoque, 2016; Nugent, 2009; Rahman et al., 2020).

Students should also be given the opportunity to interact with their peers in the social learning environment in addition to teacher-student contact. Hurst et al. (2013) assert that students often build knowledge and comprehension through mentally stimulating activities. According to studies, social engagement ensures that students feel at ease and self-assured, consequently developing a sense of teamwork. Additionally, social interaction aids SWPDs in improving their reading, speaking, and social abilities. It further affords students more courage to ask questions for more clarity, making it a more effective tool for knowledge, skill, and attitude growth than self-learning (Rahman et al., 2020; Roorda et al., 2011).

It is further argued that in addition to improving student learning, student-student interaction increases retention by igniting connection with prior knowledge, thus combining new ideas and aiding the students in developing their critical thinking and problem-solving skills (Akhtar et al., 2019; Hurst et al., 2013; Varga, 2019). The basic orientation of thought is that teacher-student and student-student interaction as part of the essential components of the social learning environment are crucial for the performance of the SWPDs. This is based on the insights from the theory and the empirical data from literature reviewed.

4 Methodological approach

We used a cross-sectional survey to enable us collect data in a single study area and point in time. This design was employed based on the nature of the study which involved a single case – Dodoma City, the capital of Tanzania located in the country's Central Zone. Due to its size, location, and historical significance, Dares Salaam is recognised as the country's business centre and the main political hub. A total of 17 public secondary schools participated. These schools were picked through the multistage sampling procedure while primary data was accrued through a structured questionnaire administered to students and teachers. The study population and sample included SWPDs and teachers in the selected schools. The sample size totalled to 327 randomly selected

respondents from schools with SWPDs. Of these, 294 were teachers while 33 were SWPDs. The sample constituted comparatively fewer SWPDs because that was the maximum sample size we could get from the schools providing inclusive education.

Table 1 Distribution of the study participants by category/title

<i>Category</i>	<i>Number</i>	<i>Proportion (%)</i>
Teacher	294	89.90
SWPDs	33	10.10
Total	327	100

Source: Fieldwork, 2021

4.1 Data analysis techniques and procedures

Collected data were entered into MS-Excel 2016 for data cleaning and sorting based on information obtained from students and teachers. The data were organised prior to being loaded into IBM-SPSS version 25 for analysis. PLS-SEM analysis was employed in this study to analyse quantitative data which was then presented as inferential statistics. Research data was examined, presented, and the overall interpretation of influence on each variable was then illustrated in figures and charts.

5 Results

5.1 The influence of SWPDs – teacher and student –SWPDs interaction on the performance of SWPDs

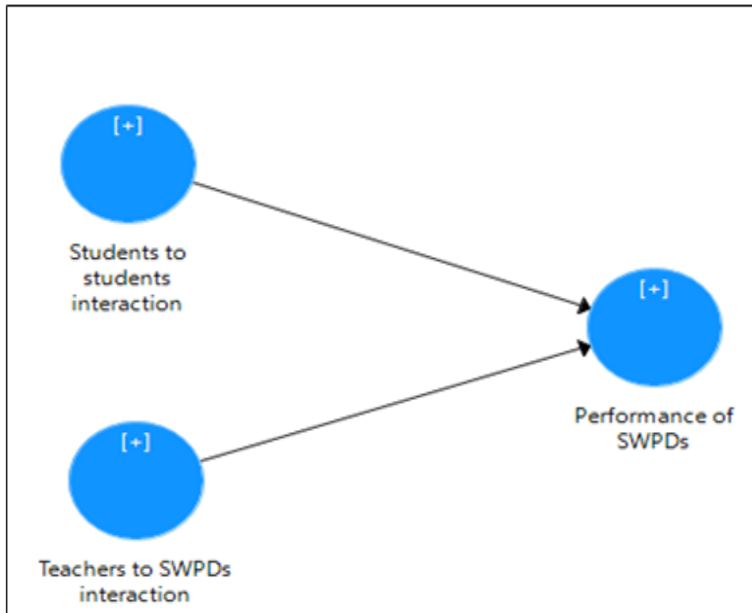
The influence of the interaction between SWPDs, teachers, and other students on SWPDs' performance was examined in this study. The evaluation took the following factors into account: consultations with specific students, SWPDs' interaction with teachers during class sessions, teachers' movement within the classroom, and SWPDs and teachers' sharing of personal experiences. Additionally taken into account are the SWPDs' discussions, student group assignments, the support of other students for the SWPDs, and the teaching and learning resources used in classrooms. Thus, the influence of interaction was measured based on the description of the model in Figure 1.

5.2 Structural model of the influence of teacher-SWPDs interaction on SWPDs performance

The conceptualised study model is depicted in Figure 1 and includes two exogenous variables – teacher – student and student-teacher interactions, as well as an endogenous variable (dependent variable) that is SWPD performance.

Exogenous variables from the aforementioned model have interaction categories of five units for students-students and four units for teachers-students interaction, while endogenous variables have eight units under study.

Figure 1 Structural model for the influence of teachers-SWPDS interaction on the performance of SWPDS (see online version for colours)



5.3 Model analysis

Validity, internal reliability, and construct goodness of fit assessments were all considered during the model analysis process. The construct validity test was used in the study to determine whether the outcomes intended to be measured were actually achieved. Fornell and Lacker (1981) stated that each latent variable’s ‘square root’ (AVE, or average variance extract) should be greater than the correlations among the latent variables.

Table 2 Fornell-Larcker criterion analysis for checking discriminant validity

<i>Variable</i>	<i>1</i>	<i>2</i>	<i>3</i>
1 Performance of SWPDS	1		
2 Students-students’ interaction	0.747	1	
2 Teachers-SWPDS interaction	0.694	0.751	1

In reference to the model, the results displayed in Table 1 demonstrate that the square root of each of the two latent variables is greater than the correlation value. For instance, the interaction between students on SWPD performance was determined to be 0.747, therefore its square root is 0.8643 (approximated to 4 decimal places), which is higher than the correlation value. The findings demonstrate that discriminant validity is confirmed in the current study.

5.4 Reliability and VIF of the model

The indicator reliability was used to determine reliability (capturing the categories of latent variables), and it was tested by determining whether the data collection tool or procedure can yield the same results when utilised effectively by different researchers in diverse areas of study. The ‘indicator reliability’ which is the square of the outer loadings was used to calculate the instrument’s internal dependability using outer loadings (Table 2).

The decision criterion rests on the condition that indicator reliability values which are larger than the least and minimum acceptable level of 0.4 and close to the preferred level of 0.7 are considered. Table 2 demonstrates that most of the indicators have individual indicator reliability values that are remarkably larger than the minimum acceptable level of 0.4 and close to the preferred level of 0.7 except student-student three which was less reliable since it was lower than the acceptable threshold. In reference to the VIF of the model, the results in Table 3 indicate that the VIF (variance inflation factor) values of the latent variables are lower than five. According to Kline (2018), a VIF output less than five demonstrate that there are no multicollinearity problems among the model’s independent variables, hence, it was confirmed that the independent variables in the model are significant.

Table 3 Reliability and VIF measure of the variables under study

<i>Variable</i>	<i>Category</i>	<i>Outer loadings</i>	<i>Indicator reliability</i>	<i>Decision criterion</i>	<i>VIF</i>
Student-students interaction	Teacher_S1	0.776	0.6022	Highly reliable	2.393
	Teacher_S2	0.914	0.8354	Highly reliable	3.009
	Teacher_S3	0.858	0.7362	Highly reliable	1.909
	Teacher_S4	0.827	0.6839	Highly reliable	1.156
	Teacher_S5	0.858	0.7362	Highly reliable	2.107
Teachers-SWPDs interaction	Student_S1	0.902	0.8136	Highly reliable	2.272
	Student_S2	0.772	0.5960	Medium reliable	2.597
	Student_S3	0.44	0.1936	Less reliable	2.194
	Student_S4	0.847	0.7174	Highly reliable	1.965

5.5 Model fit summary

Table 3 reveals the model’s fitness with the projective performance of the path model for the manifest variables (MV or indicators) and the latent variables (LV or constructs). The assessment criteria are defined by Dijkstra and Henseler (2015) and d_{ULS} (i.e., the squared Euclidean distance) and d_G (i.e., the geodesic distance), standardised root mean square residual (SRMR), Chi-Square and normed fit index (NFI).

The model fit summary shows the d_{ULS} and d_G representing two dissimilar ways to compute discrepancy between the empirical covariance matrix and the covariance matrix implied by the composite factor model. The NFI shows that the fit measure is 0.944, which is the best fit since it is within the acceptable range close to 1. In addition to that, the SRMR value of 0.039 is the best fit since it is also within the acceptable range of 0.01 to 0.1 (Lohmöller, 1989). The NFI was used in this study since the χ^2 value of the

proposed model by itself does not provide sufficient grounds to judge the model fit, the NFI uses the Chi² value from the model as a yardstick.

Table 4 Summary of the model fit

<i>Test</i>	<i>Estimated model</i>
SRMR	0.039
d_ ULS	0.237
d_ G	0.126
Chi-square	204.144
NFI	0.944

5.6 Path coefficients and hypothesis

The path coefficient results computed in the model was based on the bootstrapped to ensure the stability of results. Results in Table 4: indicate that there is a positive highly significant ($p < 0.001$) influence of 51.6% (0.516) on student to student interaction towards the performance of SWPDs hence the null hypothesis that states that “there is no significant influence between students to student interaction and SWPDs’ performance” is rejected. On the other hand, the influence of student to teacher interaction was 27.8% on the Performance of SWPDs and is highly significant ($p < 0.001$) hence, the null hypothesis that states “there is no significant influence of students to teacher interaction on SWPDs’ performance” is rejected.

Table 5 Bootstrapped results for path coefficients and hypothesis

<i>The influence of social interaction on performance of SWPDs</i>	<i>Original sample</i>	<i>Sample mean</i>	<i>SD</i>	<i>T</i>	<i>P-values</i>	<i>Ho</i>
Students to students’ interaction -> performance of SWPDs	0.516	0.521	0.072	7.205	< 0.001***	Reject
Teachers to SWPDs interaction -> performance of SWPDs	0.278	0.281	0.077	3.599	< 0.001***	Reject

Notes: The symbol -> indicates the ‘is influencing’, *** means significant at 1%, ** means significant at 5%, * means significant at 10%.

The structural model in Figure 2 demonstrates the influence of each latent variable and its respective units with specific p-values as indicated in the closed brackets.

The structural model in figure demonstrates a highly significant ($p < 0.001$) influence of student-student and teacher-student interaction on SWPDs’ performance. Table 5 further demonstrates that the internal components variables that influence the latent variables was obtained per each of the two significant variables.

As further indicated in Table 5, the influence of teacher-student interaction on the performance of SWPDs is highly significant ($p < 0.001$). For instance, the frequency of SWPDs’ interaction with their teachers during classes (Teachers_S2) contributed 47.2% to the interaction. Similarly, the results show that the movement of teachers around the class to check individual students has a positive contribution (Teachers_S3) of 31%, and

has a high statistical significance of $p < 0.001$. Moreover, the results demonstrate a high statistically significant influence of shared experiences between teachers and SWPDs (Teacher_S4), which contributes 29% of the interaction. In reference to the contribution of student-student interaction as shown in Table 5, all four internal components have a significant contribution to the interaction. The results show that the interaction is strongly influenced by SWPDs' engagement in discussions with other students (Student_S1) by 30.1%, active involvement in group assignments (Student_S2) by 31.1%, receiving support from students without disabilities (Student_S3) by 19.9%. It was however revealed that teaching and learning aids used in schools had a minimal contribution (Student_S4) of 13.3% while holding debates at different levels (Student_S5) had a moderate contribution of 29.4%.

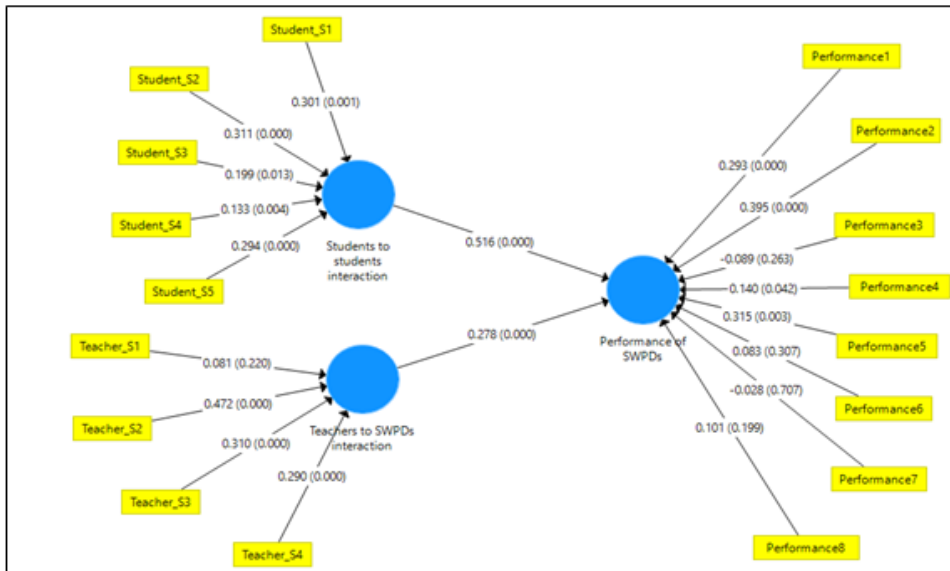
Table 6 Inter-contribution of component latent variable on itself basing on significant latent variables

<i>Interactions</i>	<i>Original sample</i>	<i>Sample mean</i>	<i>SD</i>	<i>T</i>	<i>P value</i>
Student_S1->Student-students interaction	0.301	0.294	0.088	3.419	0.001***
Student_S2->Student-student interaction	0.311	0.316	0.089	3.512	< 0.001***
Student_S3->Student-student interaction	0.199	0.197	0.075	2.654	0.008**
Student_S4->Student-student interaction	0.133	0.127	0.045	2.922	0.004**
Student_S5 -> Students to students' interaction	0.294	0.295	0.068	4.344	< 0.001***
Teacher_S1 -> Teachers to SWPDs interaction	0.081	0.081	0.068	1.191	0.234
Teacher_S2 -> Teachers to SWPDs interaction	0.472	0.466	0.076	6.232	< 0.001***
Teacher_S3 -> Teachers to SWPDs interaction	0.310	0.310	0.080	3.875	< 0.001***
Teacher_S4 -> Teachers to SWPDs interaction	0.290	0.292	0.068	4.277	< 0.001***

5.7 *The impact of attendance on SWPDs' performance*

The model in Figure 2 indicates that SWPDs' regular attendance of classes influences performance 1 by 29.3%, SWPDs' attendance of above 75% has a 39.5% impact on performance 2 in the model. It was further revealed that SWPDs' achievement of upper grades (from B and above) has a 14% impact on performance 4 while SWPDs' participation in class discussions has a 31.5% impact on performance 5. Therefore, it is evident that all parameters have a significant influence on the performance of SWPDs.

Figure 2 Structural model for assessing the influence of teachers and students’ social interaction on SWPDs’ performance (see online version for colours)



6 Discussion of the findings

The study discovered a positive relationship between the social learning environment and SWPDs’ performance in the selected schools in Tanzania, which suggests that when the government creates a learning environment that is appropriate for students with physical disabilities, there is a high likelihood of inspiring the students to believe in their capacity to learn and actively participate in all activities, both academic and extracurricular activities. The results are in line with those by Yeung et al. (2014), Wang, (2018), and Roorda et al. (2011), who revealed that students’ performance can be enhanced through social engagement in a social learning environment in numerous ways. They also contend that interactions between students themselves produce the highest level of accomplishment. For instance, when a student with low learning skills and one who is academically motivated engage, both students’ performance is considerably improved. Additionally, the encounter leads to the socialisation of attitudes, beliefs, and worldviews. Thus, social interactions are employed as predictors of future psychological health, improved social skills, and decreased societal challenges like the potential for drug abuse and social isolation. This suggests that both interactions that is, student-student and student-teacher considerably impact the performance of SWPDs in secondary schools.

The study discovered that student high accomplishment in both academic and extracurricular activities is related to interactions between teachers and SWPDs. Compared to other variables, the findings indicate that interaction has a 47.2% contribution to student achievement. As observed in the model, a teacher moving about has a favourable substantial impact on SWPDs’ achievement. The results are in line with earlier studies, including those by Hoque (2016), Hurst (2013), Li and Yang (2021),

Nugent (2009), Pervin et al. (2021), and Rahman et al. (2020), which found that students perform better in both academic and extracurricular activities the more they interact with their teachers. Furthermore, it is evident that when active involvement is maintained, students learn to value educational activities, which results in a sense of self-efficacy and a positive outlook, both of which boost performance. Based on the results of the current study, SWPDs can perform on parity with their abled counterparts in the presence of a supportive teaching and learning environment.

Student-student interaction has also been proven to positively impact on SWPDs' performance. In the current study, student-student interaction refers to SWPDs' active participating in class discussions and extracurricular activities with regular students. According to Hurst et al. (2013), people actively construct knowledge and cognition through engaging processes. This suggests that when students freely communicate with their peers within and outside of the classroom, they become more at ease, competent, and confident. By doing this, students' performances and in particular, SWPDs' become incredibly remarkable to them and the general society. Controversially, SWPDs who are learning in a monotonous or passive and non-participatory and involving environment perform poorly in comparison to those who are. The results support the findings of (Akhtar et al., 2019; Hurst et al., 2013; Varga, 2019) who discovered that student-student interaction improves their comprehension and retention of the knowledge gained, owing to its capacity to promote positive thinking, critical thinking, and problem-solving abilities.

7 Concluding thoughts and implications

On the basis of the findings, we draw the conclusion that the social learning environment has a beneficial impact on the performance of SWPDs based on the positive and significant effects that teacher-student and student-student interactions have demonstrated on the performance of SWPDs in the selected schools. This suggests that improving the social learning environment for SWPDs boosts their performance and enables SWPDs to acquire knowledge, skills, and favourable attitudes. These findings highlight the need of utilising interactive teaching and learning strategies by subject instructors and school administration.

8 Limitations of the study and suggestions for alternative approaches

The following methodological, topical, and geographic restrictions apply to the current study: – Firstly, because the study was solely quantitative, the results do not adequately reflect the social intricacies and aspirations of the participants. To enhance the explanations, the statistical results could have been supplemented with qualitative information from follow-up interviews with participants. Second, while the field of study covers a wide scope of disabilities, it concentrated solely on students with physical disabilities and owing to this constraint therefore, the conclusions are confined to SWPDs. This limitation opens up avenues for new research in other sub-topics in the field. In addition, Dodoma City was solely the focus in the investigation, thus, the findings cannot be generalised to any other city in Tanzania except Dodoma. Another

study can be designed as survey involving many cases and a large sample size to so widen the scope of generalisation.

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