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Prospects and Challenges that Teachers and Learners Face when using Field Study in Teaching and Learning Biology Subject at Ordinary Level of Secondary Education: A Case Study of Public Secondary Schools in Morogoro Municipality

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Abstract:- Learning that occurs in a field setting is widely recognized as a very effective approach to connect science content to the real world. It is also a powerful experience that promotes the development of learners' scientific skills, enhances active learning and promotes enthusiasm to biology subject among students. However, teaching biology through field study encounters several challenges that impedes effective implementation in public secondary schools. Thus, this study seeks to investigate the Prospects and Challenges that Teachers and Learners Face when using field study in teaching and learning biology at ordinary level of secondary education and to establish remedial measures to address these challenges. The study uses purposive sampling to select 56 respondents from 107 population including 10 heads of public secondary schools and 46 biology teachers. The study also adopted a concurrent transformative mixed approach. Data were collected by using interview guide and questionnaire. The reliability of the instruments was tested by computing Cronbach's coefficient alpha (α) during pilot study where inter-item correlation was proved to be r = 0.872. The qualitative data was confirmed to be credible, transferable, confirmable and dependable through trustworthiness. The quantitative data analysis was done through Statistical Package for Social Science (SPSS) version 25 computer, while qualitative data were analyzed thematically. The study identifies institutional barriers to field study such as inadequate resources, overcrowded classes and fear of risk. Teachers face barriers such as traditional teaching styles, shortage of biology teachers, inadequate training, lack of experience, and fear of student risks. To address these challenges, the study recommends that the collaboration between school administrators, and field site management ad teacher's training may foster a positive school culture, resource mobilization, employing more teachers, formulating supportive policies and utilizing school surroundings for study.

Keywords:- *Prospects, Challenges, Public Secondary Schools, Field Study, Teaching.*

I. INTRODUCTION

Learning that occurs in a field setting is a powerful experience that promotes the development of new generations of creative scientists, enhances environmental literacy, and instills social responsibility in our citizens, field study in Biology typically involves studying free-living wild animals and plants in which the subject is observed in their normal habitat (Shibrot et al 2022). Field studies are essential for understanding life and the biological sciences, as they provide a grounding for research strategies. Reforming biology requires examining intersections of structural, methodological, and societal practices on multiple levels (Tanner et al, 2021). A holistic approach to science educators is crucial to ensure students' lives are connected to the world around them this poses challenges for teachers, students, planners, and policymakers in developing countries (Semali 2012). Furthermore, Field-based experiential learning fosters passion and commitment in STEM subjects by allowing students to apply skills and knowledge in authentic contexts, enhancing academic skills and contextualizing learning across disciplines (Zhan et al., 2022). Field experiences enhance human-nature relationships and sustainability,

However, Washinton National Research Council (2009) stress that, when learning is discussed, it is most often assumed to occur in the formal classroom setting despite the fact that learning can be contextualized, affected by motivation, expectation, prior knowledge, experience, prior interests, beliefs, control, and choice. A study by Ortiz (2020) on A Professional Development Opportunity for Educators in California (USA) also found that lack of hands-on activities environmental education in many primary school systems is due to lack of funds, large classroom sizes, and overloaded school curricula. Institutional economic factors as determining factor of how science is implemented is also highlighted by Zhan et al (2022). Amoah et al (2023) found

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that insufficient resources from the Ministry of Education in Ghana hinder effective biology study in selected central regional schools. Abimbola & Abidoye, (2013) revealed that in Nigeria some Biology teachers are not adequately teaching ecology due to their difficulty in certain syllabus areas.

Between 1965 and 2007, Tanzania implemented several science education projects, including the Science Education in Secondary School Project (SESS) and the Science Improvement Project, to improve secondary science and mathematics classroom performance and develop teaching materials. These projects highlighted a lack of holistic approach to science education that would ensure students were connected to their environment around them. Matogwa (2023) revealed that, Tanzanian students memorized facts applicable neither to their indigenous knowledge and culture nor to their lives outside the classroom. Concern for the current research study is based on school identifying administrative and Teachers factors that impede biology field study in secondary schools. The study proposed solutions to such challenges.

Kinyota's (2020) revealed that challenges like large class sizes, insufficient time allocation, and overemphasis on content coverage in science teaching, highlighting the need for improvement. Meanwhile, United Republic of Tanzania, through its Institute of Education (TIE) (2023) proposed competence-based biology syllabus for ordinary secondary education from 1 to form 4 which suggests teaching and learning methods for each activity which includes field visits, practical work, research, project works among others. Teachers are expected to plan and use other appropriate methods based on the environment or context. All the teaching and learning methods should be integrated with the everyday lives of students. The syllabus gives clear directive such as, to acquire communicating skills using scientific biological terminologies and competencies.

Currently (2023), the United Republic of Tanzania's Institute of Education has proposed a competence-based biology syllabus for secondary education, incorporating field visits, practical work, research, and project work. The syllabus aims to integrate teaching methods with students' every day's lives and promote communication skills using scientific biological terminologies and competencies. TIE is recommended that**;** Field visit should include students' guidance in collecting various living things around the school compound and grouping all the items according to their similarities. Furthermore, the learning activities to include conducting field trip such as guiding students to visit nearby health facility to learn about types of blood cells, blood groups, blood pressure and blood transfusion. Thus, the syllabus recognizes importance of field study in biology.

Mabula (2012) highlighted the challenges of promoting science subjects for secondary school students due to shortages of teachers, resources, textbooks, and teaching aids. Matogwa (2023) on secondary school science education in Tanzania reveals that students consume distorted natural sciences, preventing the development of science and technology., added that knowledge is often disconnected from students' social environments, such as biology, where they are taught to understand nature through Western classifications. In sub-Saharan Africa, school systems are facing a decline in materials supply and education quality due to insufficient, inefficient, and unsustainable funding levels (Stelah et al., (2022).

School institutions continuously shift focus from classroom-based teaching to competence and hands-on activities, with the sustainability of this shift largely attributed to institutions as driving forces and custodians of culture and practice. Harvey et al., (2020) indicate that British schools are underutilizing their habitat grounds, indicating a need for curriculum changes to fully utilize these spaces. Scott et al., (2014) identified barriers to biological fieldwork in the UK, including school culture, teachers, organizational practices, cost constraints, and child behavior. Furthermore, EI-Deghaidy (2017) revealed that institutional limited resources impact teaching activities implementation. Higenyi et al., (2017) in Uganda highlighted the importance of relationships with stakeholders and overcrowded classes in failure to implement teaching activities and programs. Wolf et al., (2022) established barriers to outdoor study implementation, that include insufficient experience and training, lack of collaboration, creativity, and strategies for outdoor learning and sustainability in UK. Additionally, Borsos et al., (2022) stress that teachers are dissatisfied with the knowledge they have received during their training.

Dillon et al., (2016) found that outdoor learning in the UK faces challenges such as fear, natural hazards, threats, physical discomfort, getting lost, encountering snakes, or poisonous plants. Kandamby (2018) study highlights the crucial role of teachers in enhancing learning through field study in Sri Lanka, highlighting their role in organizing, conducting discussions, monitoring progress, and providing feedback. In a related study Njati (2022) established the need for up-scaling resource mobilization for competency-based curriculum implementation due to institutional insufficient resources that hinders individual schools' ability to make equitable resource trade-offs.

Çimer (2011) found that biology learning is challenging due to the topic's nature, lack of resources, and teachers' teaching style in Turkey. To improve learning, strategies like visual materials, practical work, and connecting topics to daily life are recommended. Zhan et al., (2022) highlights the importance of teachers' professional development, interdisciplinary integration, technology adoption, and pedagogy application in enhancing learning in China. Furthermore, Fleischner et al., (2017) (earlier cited), found that instructors face numerous financial, logistical, legal, and attitudinal challenges in implementing field study that consuming time that could be better spent on student engagement in field experiences.

Meanwhile, Mabula (2012) (earlier cited), reveal that the teaching and learning of science is more theoretical than observational, experiential and experimental based. This situation affects the interest of students to take these subjects in their higher studies. In the current efforts for curriculum

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reform, planners continue to struggle with colonial legacies and the evidence is seen in highly structured and prescriptive physics, chemistry and biology syllabi, originating from Tanzania Institute of Education in the Ministry of Education and Vocational Training. Additionally, even though teachers are encouraged to adapt the prescribed subject matter to local environment and between a student's world of life and school science, few teachers attempt the border-crossing to utilize surrounding environment.

However, Mkimbili et al., (2019) study suggests that it is important to enhance student motivation in science subjects through local resources, study tours, real-life examples, and practical work in schools, while contextual challenges should be looked at. Moreover, Çimer (2011) (earlier cited) revealed that Strategies for effective biology learning include visual materials, practical work, curriculum reduction, using appropriate study techniques, connecting topics to daily life and making learning interesting.

Abimbola & Abidoye (2013) recommend fieldwork and practical on Ecology should be carried out satisfactory in Nigeria schools, Additionally, Amoah et al (2023) recommends sponsoring teachers to seminars and workshops, and employing qualified, experienced teachers to build a strong foundation in biology in Ghanaian schools. Dillon et al (2016) emphasize the importance of meticulous planning, thoughtful implementation, and follow-up in outdoor learning, considering factors like students' fears, prior experiences, and preferred learning styles for effective biology teaching. Furthermore, Jeronen et al., (2016) on teaching methods in Finland's biology education and sustainability recommend that including outdoor education, highlighted the importance of group work and active learning. Thus, reviewed literature points toward the value of teaching methods that can provide a good introduction and supportive guidelines and include active participation and interactivity in the field.

II. RESEARCH METHODOLOGY

The study adopted a concurrent transformative mixed method research approach. According to Creswell (2014), this methodology is employed when a researcher uses two distinct methods to confirm or corroborate findings within a single study. The study used purposive sampling to select 56 respondents that included 10 school heads, 46 biology teachers. Data were collected by using interview guide and questionnaire. The reliability of the instruments was ensured by computing Cronbach's coefficient alpha (α) during pilot study, where inter-item correlation was proved to be r = 0.872, while qualitative data was confirmed to be credible, transferable, confirmable and dependable through trustworthiness. Quantitative data analysis was done through Statistical Package for social science (SPSS) version 25 computer and qualitative data were analyzed thematically, all together helped researcher to identify both schools' institutional factors and teacher factors that affect field study in biology teaching in public secondary school, and to establish remedial measures to address the identified challenges.

III. FINDINGS & DISCUSSION

The study investigated the prospects and challenges of conducting field studies in teaching biology using a questionnaire and interview guide. It analyzed institutional and teacher factors that hinder field studies, and suggested solutions to address identified challenges. Respondents were asked to express their opinions on the presented items by stating whether they agreed, neutralized, or disagreed.

Table 1 present the distribution summary of respondent's views on institutional factors that hinder field study in biology teaching. (The other 10 participants were involved in qualitative data collection)

Table 1 Institutional Factors that hinder Field Study in Biology Teaching (n=46)

Item	AF (%)	NF (%	DF (%)	Total F (%)
Lack of adequate fund	43 (93.4%)	0(0%)	3(6.5%)	46(100%)
Complicated administrative permit procedures	25 (54.4%)	11(23.9%)	10(21.7%)	46 (1005)
Lack of cooperation from school administrators	20(43.5%)	12(26.1%)	14(30.4%)	46(100%)
Fear of risk management by administrators	31(67.4%	6(13%)	9(19.6%)	46(100%)
Head of school heavy load	29(63%)	12(26.1%)	5(10.9%)	46(100%)
Overcrowded curriculum	40(87%)	1(2.2%)	5(10.8%)	46(100%)
Lack of coordination by school management	35(76.1%)	1(2.2%)	10(21.7)	46(100%)
Inadequate time	32(69.6%)	10(21.7%)	4(8.7%)	46(100%)
Lack of equipment for field study	26(56.5%)	7(15.2%)	13(28.3%)	46(100%)
Poor field study planning by administrator	28(60.9%)	7(15.2%)	11(23.9%)	46(100%)
Transportation problem	24(52.2%)	36.5%)	19(41.3%)	46(100%)
Poor communication between SA and FSM	14(30.4%)	11(23.9%)	21(45.7%)	46(100%)
Lack of accountability by SA	15(32.6%)	6(13.0%)	25(54.4%)	46(100%)
Lack of commitment by SA	24(42.2%)	4(8.7%)	18(39.2%)	46(100%)
Low support to teachers from SA	35(76.1%)	6(13.0%)	5(10.8%)	46(100%)
Insufficient field work training from TI	33(71.7%)	10(21.7%)	3(6.5%)	46(100%)
Over emphasis of content coverage in teaching	27(58.7)	6(13.0%)	13(28.3%)	46(100%)
Low motivation by SA	29(63.0%)	6(13.0%)	11(23.9%)	46(100%)
Insufficient supply of resources	34(74.0%)	5(10.9%)	7(15.2%)	46(100%)

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Low community involvement in field study issues	29(63.1%)	5(10.9%)	12(26.1%)	46(100%)
Shortage of SET needed for special need students	32(69.6%)	7(15,2%)	7(15.2%)	46(100%)
School culture	32(69.6%)	6(13.0%)	8(17.4%)	46(100%)
Difficult in FLA by School Administrator	26(56.5%)	9(19.5%)	1123.9	46(100%)
WV included in curriculum leaving behind SE	25(54.3%)	1(2.2%)	20(43.5%)	46(100%)
Low moral by administrator	31(67.4%)	4(8.7%)	11(23.9%)	46(100%)
Pressure to meet assessment and inspection targets	34(73.9%)	4(8.7%)	8(17.4%)	46(100%)

Table 1 reveals a lack of adequate funds 43(93.4% as the main institutional challenge affecting effective field study in biology, consistent with Nzikako & Warue (2023) findings that stressed lack of science-outdoor education in many primary systems is primarily due to a lack of funds. During interview, a respondent opined that.

Inadequate funding is a challenge for Biology field study were by fee free education gives inadequate fund yet parents resist to make any contribution due to lack of Understanding of the policy, therefore, teachers sometimes do internal field studies only **(HT2).**

HT2 reports inadequate government funding to run activities for schools through fee-free education policy, with parents resisting contributions due to lack of understanding, and public schools primarily rely on government capitation grants. It seems that Biology teachers are facing a significant challenge in acquiring necessary materials for field study. Therefore, it can be said that lack of adequate financial support from administrators to cover field study expenses hinders field studies conduction.

The second sub item in rank order was on overcrowded curriculum 40(87%). Respondents identified that overcrowded curriculum as institutional challenge that hinder effective field study in Biology. This finding concurs with Takeda et al., (2021) who revealed that curriculum contents play a significant role in promoting or hindering sustainability of experiment and scientific techniques. This implies that a more comprehensive field-based learning experiences depends on number of activities indicated in curriculum. During interview a participant explained that:

Biology field studies needs more time than classroom teaching, Biology curriculum content should be reduced to have more time for field studies because there are too many concepts needed to be covered in short time frame **(HT7).**

The respondents (HT7) believe the current curriculum is overloaded with activities, hindering effective field study, and advocate for a more focused curriculum to allow more time for regular biology field studies. The finding suggests that reducing curriculum content could facilitate competency-based curriculum implementation by exposing students to the environment through biology Field studies.

The third sub item was low support to teachers from school administrator 35(76.1%). The respondents viewed low support to teachers as institutional factor that hinder carrying out regular field studies in biology. This finding concurs with Young et al (2021) who stressed that offering innovative learning environment alone will not bring about significant changes to teacher practices nor students' learning experiences but supporting teachers to perceive and utilize spaces that offer multiple activity setting is necessary. Low support to teachers, viewed as an institutional factor, hinders regular field studies in biology. Supporting teachers to use multiple activity settings and fostering a sense of connection and belonging, as per SDT Theory by Ryan and Deci (2017), is crucial for promoting participation in field study activities.

The fourth sub item that respondents considered as an institutional factor that hinder field study in biology teaching was insufficient supply of resources 34(74.0%). This finding is supported by Njati (2022) who found that insufficient teaching and learning resources hinder schools' ability to make equitable decisions regarding competency-based curriculum implementation. This finding seems to suggests that inadequate resources, such as protective gear, can hinder students' access to diverse field sites, limiting their exposure to various habitats and species in biology teaching.

Inadequate training 33(71.7%) was the fifth sub item that respondents considered as an institutional factor which impedes field study in biology. This finding is supported by Labak & Labak &Blažetić (2023) and Nurgaliyeva et al (2022) who revealed that training of teachers focuses on self-development and professionalism, which in turn enhances their teaching skills through fieldwork. Based on this finding, lack of field work training appears to negatively affect field study in biology teaching, possibly due to current preparation programs prioritizing theoretical knowledge over practical experience, that makes teachers feel underprepared and unconfident that hinders their ability to provide students with field study learning experiences. The SDT theory also support this finding by emphasizing that an individual need to be confident in order to be motivated to participate in specific teaching or learning activity.

The seventh sub items that were viewed as a hindrance to field study in Biology were fear of risk management by administrators 31(67.4%) and low moral by administrator 31(67.4%). This implies that both risk management and low morals on the part of Heads of school's towards biology field studies were considered as institutional challenges that hinder field study in biology. This finding is in tandem with Dillon et al (2016) who stressed that possible natural hazards, getting lost and encountering snakes or poisonous plants were reasons which causes fear to effective biology teaching. This seems to imply that School Heads fear to be hold accountable for risks that might happen to students and teachers during field studies. Thus, fear can lead to restrictions on outdoor teaching, discouraged field studies ultimately favoring indoor

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learning environments out-door learning. Therefore, it is important for Government and schools' management to initiate measure such as providing safety training and ensuring schools are equipped with first aid kits. Safety knowledge and skills from training will reduce fear and build confidence to Heads of schools towards field studies.

On the sub item on western values included in curriculum leaving behind surrounding environment 25(54.3%) respondents' views was slightly above average. That, teachers and learners regarding the biology field studies as a foreign ideology is an impediment fact. This finding is in line with Kugara & Mdhluli (2023) who stressed that dominance of Western scientific perspectives within the standard biology curriculum led to ineffective field study in biology. Furthermore, Ramdiah et al (2020) opined that curriculum often prioritizes the contributions of Western scientists neglecting the significant discoveries and traditional ecological knowledge of indigenous and other non-Western cultures while the application of local wisdom-based learning model and tools was quite effective in improving student learning outcomes. Based on the finding it appears that students memorize facts applicable neither to their indigenous knowledge nor their lives outside the classroom. Western-influenced biology curriculum often neglects diverse flora and fauna present in local environment, focusing on North America or Europe, neglecting the rich biodiversity and ecological challenges in another region. Therefore, it can be concluded that, a biology curriculum that prioritizes Western values creates a significant institutional barrier to field.

Table 2 present the distribution of the summary of respondent's views on teacher's factors that enhance or hinder field study in biology. (The rest 10 respondents were involved in qualitative data collection)

Table 2 Teacher's Factor that Hinder Field Study in Biology Teaching. (n=46)

Item	A	N	D	Total
Lack adequate training by teachers	34(73.9%)	9(19.6%)	3(6.5%)	46(100%)
Large classroom size	44(95.6%)	1(2.2%)	1(2.2%)	46(100%)
Lack of appropriate training by teachers	33(71.8%)	6(13.0%)	7(15.2%)	46(100%)
Poor preparation by teachers	23(50%)	9(19.6%)	14(30.4%)	46(100%)
Lack of Teacher's accountability	28(60.9%)	7(15.2%)	11(23.9)	46(100%)
Lack of commitment by teachers	27(58.7%)	9(19.6%)	10(21.8%)	46(100%)
Low support from school Management	27(58.7%)	6(13.0%)	13(28.2%)	46(100%)
Low level of understanding of FS matters by teachers	31(67.4%)	6(13.0%)	9(19.6%)	46(100%)
Shortage of biology teachers	34(74.0%)	6(13.0%)	6(13.0%)	46(100%)
Low motivation by teachers	33(71.8%)	2(4.3%)	11(23.9%)	46(100%)
Lack of experience in field study	33(71.8%)	4(8.7%)	9(19.6%)	46(100%)
Lack of creativity by teachers	32(69.6%)	5(10.9%)	9(19.6%)	46(100%)
Lack of field study strategies	31(67.4%)	7(15.2%)	8(17.4%)	46(100%)
Teacher's traditional style of teaching	35(76.1%)	7(15.2%)	4(8.7%)	46(100%)
Inadequate time for field study	37(80.4%)	4(8.7%)	5(10.9%)	46(100%)
Difficult to manage student's	29(63.1%)	10(21.7%)	7(15.2%)	46(100%)
Fear of risks to students	31(67.4%)	4(8.7%)	11(23.9%)	46(100%)
Low opinion towards field study	18(39.1%)	10(21.7%)	18(39.1%)	46(100%)
Rigidity of teachers to change	23(50.0%)	10(21.7%)	13(38.2%)	46(100%)
Lack of confidence by teachers	17(37.0%)	9(19.6%)	20(43.5%)	46(100%)

Table 2 shows that the first sub item in order of respondent was large classroom size 44 (95.6%) that score highest percentage as the teacher's prime factor that hinder field study in biology. This finding is in line with Lombardi et al (2021) who revealed that education team usually works with a large group of students, which is harder to motivate and control. they need to be sub-divided into small groups, nevertheless, the necessity to do a direct observation with large groups of students during teaching can take the focus away from the education goal. During face-to-face interview a respondent noted:

Field studies tours are rare because our biology classes are overcrowded leading to management hurdle and increases chance of risk when students are outside the school compound (HT3)

Respondent (HT3) suggests that high class sizes pose challenges in student management and increase safety risks. Based on the findings it seems the large number of students per class hinders the field studies' teaching and learning process. Hence, it can be recommended that educational practitioners should ensure that there is a small or reasonable number of students per each class for effective field study conduction.

The second sub item of inadequate time for field study 37 (80.4%) implies that Teachers often struggle to integrate field studies into their biology teaching plan or scheme. This is because they have to struggle to teach large and or overcrowded classes with a lot of curricular activities within a limited timeframe. This finding is in agreement with Petersen et al (2020) who revealed that substantial work goes into planning and implementing field trips, specifically

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relating to the time each stakeholder devotes to preparing for these excursions. During the interview a respondent noted:

Biology field studies needs more time than classroom teaching, Biology curriculum content should be reduced to have more time for field studies because there are too many concepts needed to be covered in short time frame (HT7).

Participants HT7 seems to imply that biology teachers face challenges in preparing and conducting field studies due to limited time, including securing transportation, permits, and developing engaging activities, which are all time-consuming duties that require significant upfront planning. Teachers might hesitate to dedicate a significant portion of time to the field study, fearing it will disrupt the smooth planned curriculum flow (necessary for meaningful learning or completely ignoring field study trip in biology teaching.

The fourth sub items were shortage of biology teachers 34 (74.0%) and lack adequate training by teachers 34 (74.0%) that score high percentage as factors that hinder field study in biology. These findings were in tandem with Peerdeman (2021) who revealed that growing student population has led to a shortage of teachers, particularly in secondary schools. During the interview a respondent observed;

Resources such as Teachers, field study assistance, and guard for field studies should be put into the Government budget and hired (HT6).

Views from respondent (HT6) appear to indicate that there is a need to hire more teachers and other field assistance. Based on this finding, the shortage of manpower in field studies appears to hinder the conduct of studies, as teachers are often overwhelmed by large class sizes, curriculum demands, planning, permissions, and logistical burdens, leading to a prioritization of classroom lecturing over practical teaching.

Teacher's lacks adequate training 34 (74.0%) was regarded by respondents as a factor that hinder field study in biology teaching. This finding is supported by Al Arsyadhi et, al. (2024) who suggested that biology teachers should have a rather broad biology training background which allows them to position themselves to conduct learning activities effectively. That, teachers should be trained on learner centered teaching techniques that will bring about meaningful learning in biology. During interview a respondent explained:

There is a need for Training to my Biology teachers on how they can conduct Field study and use available schools' environment to reduce cost for field studies (HT7).

Respondent HT7 views appear to acknowledge the demand for Teachers training to facilitate schools' out-door field studies. Training appears to promote teachers' competence in planning and conducting field studies. This finding is also supported by Ryan and Deci (2017) in SDT theory which stressed that competence as the need to feel effective and capable in a particular domain or activity, is necessary in motivating individual to actively participate a certain teaching and learning activity. Thus, it seems that lack of training of teachers was one of the factors that impedes effective field study in biology.

The last sub item in order of ranking was low support from biology teachers 28(58.7%) respondents indicated that lack of support from teachers was a factor that negatively affected field studies. This finding is supported by Dring et al (2020) who stressed that there is relationship between teachers' cooperation and job performance. Furthermore, Toropova et al (2021) denoted that lack of support can make it difficult to secure permission for field trips, leading to a reduced frequency of these vital field study learning experiences. Based on the finding it appears that support from biology teachers themselves appear to hinder field study. Therefore, it can be said that science teachers need to be cooperative so that together, they can be able to plan and carryout field study in biology teaching.

On the other hand, respondents disagreed with the sub item on the rigidity of teachers to change 23(50%), poor preparation by teachers 23(50%), lack of confidence 20(43.5%) and low opinion towards field study 18(39.1%) as teachers' factors that hinder biology field study. This implies that teachers' rigidity, preparation, confidence and opinion towards field studies in biology were not considered as factors that impedes biology field studies. This study was also set to determine the remedial measures to challenges that hinders field study in biology. Table 3 presents a summary of the distribution of respondent's views on remedial measures that should be taken to overcome challenges that hinder carrying out field study in teaching biology. (The rest 10 respondents were involved in qualitative data collection)

Table 3 Remedial measures that should be taken to overcome Challenges that Hinder carrying out Field Study in Teaching Biology. (N=46)

Item	AF (%)	NF (%)	DF (%)	Total F (%)
Training to Teachers in field study skills	44(95.7%)	1(2,2%)	1(2.2%)	46(100%)
Simplification of permit procedures	41(89.1%)	5(10.9%)	0(0.0%)	46(100%)
Collaboration between school administration and site management	45(97.8%)	1(2.2%)	0(0.0%)	46(100%)
Improve Teachers motivation	41(89.1%)	4(8.7%)	1(2.2%)	46(100%)
Utilization of school's surroundings as FS site.	40(86.9%)	6(13.0%)	0(0.0%)	46(100%)
To increase student's capitation grant by Government	39(84.0%)	6(13.0%)	1(2.2%)	46(100%)
Reduction of curriculum contents	37(80.4%)	9(19.6)	0(0.0%)	46(100%)
To employing more biology teachers	41(89.2%)	5(10.9%)	0(0.0%)	46(100%)

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Provide workshops to Teachers	38(82.6%)	8(17.4)	0(0.0%)	46(100%)
Involving various stake holders in enhancing FS	42(91.3%)	4(8.7%)	0(0.0%)	46(100%)
Formulating supportive educational policies.	41(89.2	4(8.7%)	1(2.2%)	46(100%)
To locate close possible places for FS	42(91.3%)	4(8.7%)	0(0.0%)	46(100%)
Train teachers in skills on how to guide students to visit FS environment	42(91.3%)	4(8.7%)	0(0.0%)	46(100%)
To build a positive school culture towards FS	42(91.3%)	4(8.7%)	0(0.0%)	46(100%)
Improve teachers' skills to identify area suitable FS	42(91.3%)	4(8.7%)	0(0.0%)	46(100%)
To train AD in field study resource mobilization skills	42(91.3%)	4(8.7%)	0(0.0%)	46(100%)
Training teachers in skills to prepare activities for FS	42(91.3%)	4(8.7%)	0(0.0%)	46(100%)
To provide training to teachers in skills to identify proper time FS	42(91.3%)	4(8.7%)	0(0.0%)	46(100%)
Training to teachers in giving FS feedback	42(91.3%)	4(8.7%)	0(0.0%)	46(100%)
To provide training in FS discussion	42(91.3%)	4(8.7%)	0(0.0%)	46(100%)

Table 3 shows that the sub item on participants' order was collaboration between school administration and site management 45(97.8%) scored the highest percentage as a remedial measure to overcome challenges that hinder carrying out biology field study. This finding is in tandem with Ghedin & Aquario (2020) who observed that preparation of field work or other educational activities in schools requires collaborative preparation. Oberle et al., (2021) revealed that having a principal who can moderate parent-teacher interactions can significantly decrease stress and worry for teachers. In course of interview a participant opined:

One of the challenges that impede effective field study in Biology is the Bureaucratic tendencies that delay the obtaining of the permit to conduct field study, cooperation between authorities is needed to end this problem (HT4).

Respondent HT4 views indicate that different authorities are involved in issuing permit for field study that demand complicated procedural processes. On other hand respondent pointed out that to overcome this challenge collaboration between involved authorities is important. This, finding implies that, collaboration among school heads and teachers, stake holders like parents, school management, and field site management, can facilitate effective field study in biology subjects.

The second sub-item in rank was Training Teachers in field study skills 44(95.7%). The majority of respondents agreed that emphasis on fieldwork trainings of biology teachers' training programs and in-service trainings are essential to ensure effective field study. This finding is in agreement with Tekakpınar & Tezer (2020) who indicated that little or lack of out-door training was one of the barriers to outdoor learning. Furthermore, Nurul Laily Al Arsyadhi et al (2024) found that training enhances teacher competence, enabling better curriculum implementation in connecting field experiences to broader course objectives. Moreover, Ryan and Deci (2017) in SDT theory emphasized that competence, the feeling of effectiveness and capability in a specific domain, is crucial for motivating teachers and learners to participate in specific teaching and learning activities. During face-to-face interview, a respondent explained:

There is a need for Training to my Biology teachers on how they can conduct Field study and use available schools' environment to reduce cost for field studies (HT7)

Views from respondent (HT7) seem to indicate that training biology teachers was not only important in ensuring teachers to master the skills needed to conduct field studies within school environment. Training can also help to reduce field studies' cost. Ayotte-Beaudet et al (2017) supported this finding by stressing that, school grounds have an untapped potential for contextualized science learning. It can be seen that training is paramount to teacher effectiveness in curriculum delivery.

The third sub-items included locating all possible places for field study in near place 42(91.3%), Building a positive school culture towards field study 42(91.3%) and train administrators in field study resource mobilization skills 42(91.3%). These findings are congruent with Fedesco et al (2022) who stressed that training in various aspects enables administrators to mobilization resources was necessary in ensuring effective teaching. Based on these findings it seems that utilization of learning resources within the surrounding environment is vital in facilitating outdoor teaching. Additionally, administrators should be equipped with skills to gather extra fund through resource mobilization training.

The sub-items employing more biology teachers 41(89.2%), formulating supportive educational policies by policy makers 41(89.2), improving Teachers' motivation 41(89.1%) and simplification of permit procedures 41(89.1%). Participants identified these items as remedial measures to identified challenges for carryout field study. Kandamby (2018) revealed that teacher's role is vital to make the study successful in the ways of organizing field study, conducting discussion classes to assist students, monitoring the progress and giving the feedback of the students' performance during the course of field study. Paulinus & Vanessa (2023) revealed that motivation has a significant influence on Biology teachers' interest in the use of modern techniques in teaching.

Thus, there is need for the government to motivate teachers through provision of professional development training, provide modern teaching equipment and instructional materials and regular payment of salaries and

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allowances to teachers. It seems therefore that motivated teachers are more likely to organize and conduct field studies activities. Permits enable teachers to plan and execute field trips more frequently. Finding imply that reasonable students-Teacher ratio, motivation and good educational policy can help to facilitate effective field studies.

The sub-item ON utilization of school's surroundings as a site for study 40(86.9%) was identified as important remedial measure to field study challenges in biology. Utilizing school grounds for field study in biology teaching can significantly enhance practical, hands-on learning. Miller & Thompson (2021) stressed that school's immediate surroundings reduce logistical challenges and make field studies more accessible. Additionally, Nguyen et al (2022) revealed that even small spaces can provide valuable learning opportunities. That, exploring nearby parks, community gardens, or green spaces offer opportunities to study ecosystems, observe birds' behavior, or analyze plant adaptations. This seems to indicate that schools' internal environment can be potential for field study. Thus, establishment of school gardens or butterfly sanctuaries where students participate in the planning, planting, and maintenance while observing the development of ecosystems over time, is a creative utilization of the school grounds. This means educators can transform everyday spaces into engaging learning environments resource for frequent, curriculum-aligned field studies even within the confines of the schoolyard. Therefore, it can be concluded that, schools can make use of their surroundings for biology field studies.

The sub-item on increase student's capitation grant by Government 39(84.0%), can be an important remedial measure to finance field study in biology teaching. This finding in in agreement with Obeng (2020) who revealed that increased funding enhance access and quality of education to learners. During face-to-face interview one respondent retorted:

Inadequate funding is a challenge for Biology field study because Fee free education gives inadequate fund yet parents resist any contribution due to lack of understanding that is why sometimes we do internal studies only (HT2).

Respondent (HT2) views showed that the Fee Free Government grant is not adequate to finance all teaching and learning activities. On other hand, parents resist to contribute financial assistance to school to mitigate the inadequate fund challenge in schools. So increasing Students' Capitation Grant could be one of the remarkable solutions to inadequate fund. Wang (2023) stressed that Schools with higher capitation grants can comfortably plan and implement many activities. Data implies that increasing the student's capitation can significantly facilitate field by taking care of equipment, transportation and safety gears. The capitation grant can be a solution to field study in biology. Thus, Government should increase the capitation so as to facilitate field study in biology to schools.

The sub-item on reducing curriculum contents by curriculum developers 37(80.4%) was considered as remedial measures to field study in biology teaching. This finding is in agreement with Kristiyanto (2023) who recommended that it is necessary to implement curriculum change that is more flexible, humanistic, and dynamic in the learning process. It implies that reducing curriculum content allows for more time which allows teacher to be flexible on practical activities planning

*Biology field studies needs more time than classroom teaching, Biology curriculum content should be reduced to have more time for field studies because there are too many concepts needed to be covered in short time frame (*HT7).

Respondent HT7 seems to indicate that more time was required in field studies and one of the solutions could be reducing curriculum content. Therefore, it can be concluded that curriculum developers should revise it to ensure there are more hands-on activities in biology curriculum than theoretical concept only.

On the other hand, from table 4.4 respondents disagreed with the sub-item on the rigidity of teachers to change 23(50%), poor preparation by teachers 23(50%), lack of confidence 20(43.5%) and low opinion towards field study 18(39.1%) as teachers' factors that hinder biology field study. This implies that teachers were flexible, read to make preparation, confidence and high opinion towards field studies in teaching biology therefore, were not factors that impedes biology field studies instead, they were factors that increases chances to undertake field study in teaching biology. Thus, became teachers' prospects for field study in biology teaching.

IV. CONCLUSION & RECOMMENDATION

The aim of this study was to investigate the prospects and challenges that teachers and learners face when using field study in teaching and learning biology at ordinary level of secondary education. The study determines institutional factor, teachers' factors and best possible measure that should be taken to facilitate field studies in biology teaching. Despite the challenges to FS in teaching biology such as inadequate resources, lack of training and little cooperation, there were great chance to implemented in public secondary schools due to the presence of abundant stock of plants and animals in almost every school's surrounding environment, provided that Teachers are well trained. To address these challenges, the study recommends collaboration between school administrators and field site management, teacher training, resource mobilization skills training to school administrators, employing more teachers, formulating supportive policies, and utilizing school surroundings for field studies.

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