

GEOLOGICAL SURVEY STRENGTHENING: A STUDY CONDUCTED WITH SOMALI NATIONAL UNIVERSITY STUDENTS, EL-ADDE RURAL AREA, SANAG REGION

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ABSTRACT

This study performs a geological field in basin analysis and the geodynamic mechanism of basin formation and evolution, intended for fourth-semester geology students, in recognition of the relevance of themes covered in geosciences and related learning courses. As a result, with content knowledge, emphasis was placed on basins and the overview geology of the topographic area. Attempts were made to raise awareness in accordance with class lectures, and students were separated into teams that emphasized Geoheritage values in the applicable area. We conducted detailed reconnaissance prior to and during the field visit in the topographic terrain, which facilitated its implementation and subsequent evaluation, after the fieldtrip classified into three stages: Mobilisation field, the procedure field into the topographic area, and students implies theme. divided into three group teams in order to evaluate and apply. Both studies were conducted in the El-adde rural area of Somalia's Sanag region. a region rich in mineral resources that is dissimilar to the Uredo formation and the Taleh formation. In the Hadaftimo village, a field excursion was conducted to examine the galvanized surface of macro crystalline structures such as hills, domes, and pyramids. And the other occurred in a precisely planned region (the El-Adde well) developed by the FGS on 1970s. Due to the use of mixed-methods, several data lithospheres were collected and identified into appeared descriptive. Results indicate that the field trip successful fostering the conceptual knowledge, incentive, and a variety of competences. These results contribute to the understanding of the mechanisms of basin development and the overall geology of the terrain. As a methodology, using a research questionnaire to assess students' degree of comprehension in the topic. The selection of collection samples was based on physical properties. A geological field trip is an inevitable component of geoscience education and comprehension. The report also emphasizes that fieldtrips should be designed similarly to course syllabuses, advocate for research that requires financing.

Keywords: *Field Trip, Basin Analysis, General Geology, SNU, Geology Students*

INTRODUCTION

Fieldtrip is the process of observing and collecting data about the figured locality with certain purpose of title. And it is also conducted in the well experienced outcrops, rather than semi-controlled atmospheric of a lab or classroom. This interdisciplinary and Trans-disciplinary reflects the researchers to collect data about the dynamic places and induced geological formations around them. Although enables students and researchers to examine the way scientific theories interact with fact and Figures. Fieldtrip is paramount in both classroom lectures and activities of real life. Robust upgrade interdisciplinary a transformational content approaches, that are related by didactical exploration as inevitable for geoscience educating. Following a constructive idea, that mechanisms could be utilised learning apparatus which enable the combination for perception themes, promotion progressive for exclusive relevancies. Furthermore, those mechanisms can be the comprehending for greater article notions that are commonly tricky of learners' simplicity comprehend, thus complicated to clarified during lecturing. Within field tour, those ideas openly summarised and applies in real life, noting elaboration simple comprehend better confident understanding.

Geology teaching in Somalia is still reliant on theoretical demonstration and memorization relevancies and

deficient experimental parts of field camps. It develops into the strive obtain to merits smart, and incentive geosciences laboratories: A Field tour to achieve this, necessarily explore it is possibly lay to utilise field instrument. Thus, study conducted in accordance certain place that closes, Hadaftimo village and intended planned el-adde area; located northeast of Erigabo district roughly 50km. el-adde is hilly area and exposure significant geological features.

Theory Objectives

Ideally fieldworks incorporate field teaching, field research. By the context of learning purposes geological strengthening survey in order to maintain best productive and prototype studies of the El-adde terrain. And such progressing more comprehends of the study terrain. Facts such as deadline and security often tricky the incorporation; Nevertheless, a recession for geological field practical contact with depicts challenges for capability of upcoming innovator geologists' to analyse untapped assets in Somalia. With respect, an important and essential increase geological tour. As usual earth science could be enables taught thoroughly experiments unless solely from books, and Geoheritage. Field work defined finding unknown hypothesis and solutions Geophysical, Geo-environmental challenges, especially initial earth properties, features for appropriate establish in order to gain information rather than through a mere descriptive. Moreover, present object and physical indication might led to inception an contemporary connections, subsequently, increasing maintaining an innovative themes.

Likewise, improvement best comprehend for natural approaches, utilising science education to effectively well remarked natural environment. Improved investigation syndicate in order to upgrade eagerness field tour aspects by Somali geology students. on this investigate elaborates those instructors in many times neglect to make lessons themes into fact and figures, whereas most outcomes by lack of eagerness in the engagement of initiative procedures, therefore, students look astonished the field interaction with other students, and opportunity to work independently and group wise. Education procedure within field tour. Nevertheless, the activities utilised for improve field tour, perhaps, if one desire to affirm as such win rather than it is enough associations accurately required. Used during field. Compering to is seemed upon, which framework our limited knowledge. Furthermore, mentions which one of causes of this inadequately education and comprehend is the failure of an accurate instrument for clarification and assessment. With respect, recommend the progress and engagement of inquiry to assess the steps progressed within Field tour. Theses evaluation enables to help teachers and researches to best comprehend perceptions for the student in the studies environment however situation is, assessments for geological field research can be often allocates in an strive for develop teachings field components into every course curriculum process of geosciences.

MATERIALS AND METHODS

Researcher and students chose locality commence for field accessories that should applicable to mitigate the diagnosed terrain. research designed variety methods, likewise brief research questionnaire, learning report analysis. As such, surveyed along hills and basins, bed rocks and outcrops, The following methodologies were undertaken:

- **Taking GPS coordinates of the area:** while every point and locations of the study and routine field have taken longitude and latitude of the area. the trajectory-projectile of path follows moving under the action provide forces.
- **Measuring layering of bed rocks:** Investigation of an exposure was taken; the strike direction and Dip direction of the bed were measured with help of clinometer compass and tape.
- **Collection samples:** rock samples were collected in field place.
- **Identifications of physical properties:** collection of the minerals and rocks were described with help of a magnifying Lens. and texture and structure of their appearance.
- **Photographers:** photographs exposed geomorphic features, structures, vegetation, and topographic taken in each section. All information has obtained via above methods from exposures.



Fig. 1: clinometer



Fig. 2: Hand lenses



Fig. 3: Hand lenses



Fig. 4: Using Geological Hammer

Instrumentation:

The equipment and accessories that used in the field are as follows:

- Global Positioning System (GPS)
- Clinometer Compass
- Geological Hammer
- Hand Lens
- Camera
- Field Note Book

Table I: Characterization actions utilized in the field

Field Phases	Field actions
1. Mobilization	Teacher field organizer Planning and expectation deadline, thus field permit at happening area and governments rules and regulations. Transportations, aerial map, nature of lithology in terrain and surrounding. University Admin, Driver accompany
2. Field camp work	Student separable field guide at given coordinates. Research studies in datum area. Identify rock samples, basin type in local area. Preamble perception of the study area.
3. Study terrain	Student and researcher enables study exceptional. Rock samples and characterized keys. Litho type, Structural type, basin type of domestic field terrain.



Fig 5: Sampled gypsum

Characterization actions

The characterizing actions concentrated accordance of field habitual and mobilization allowances and it characterized into three categories actions: the mobilization, the Field camp work, and study terrain table1. that actions initiative to assist researcher, student proper diagnoses intended to teach, subsequently improvement milestone for educating results, likewise theories understanding, collective competencies, and identifying unknown resources of the area. And related purpose of the educational materials to exhibits the improvements and incentive of testimony during field trip.

Assessment Instrumentations

Various accessories and equipment subjected to combination researcher, students for following to grab informative acquired in order to assess field research. students parting diagnoses performed in the three categories in the field tournament. Thus, assessment field equipment utilized in the various categories of field study are mentioned in Table II. Part of equipment was appealed both to researchers and students. Moreover, brief research-based questionnaires asked students associates open questionnaire, the responses underwent content assessment. That research questionnaire formulated to assess the outcomes consequences of favorable and unfavorable features, both obstacles and ease in the categorical classes of mobilization or preparation into study terrain. Then reports focused assessment for research of the area undertaken, and suggest local geology in my report paper for the references of future apply. Following as result point in field trips Somali form the Science Outdoor Learning Environment Inventory was used at the conclusion of field tour to evaluate the students' responses. The procedure to validate this inventory was done these characterizations were established to assist the researcher and descriptive in following paragraph.

Inventory

The research proposal was to adapt for the semester-four of students Geoscience. Therefore, mainly objective was to use to evaluate for the Somali Geology student's outlook of field work. the scales based on Scientific labs (SL).

Validation

A quantity determining of the data questioner an instrumentation to be used with student samples from variety disciplines, education geosciences background. (Arranged systematically 1- agree, disagree-type 2 = agree to strongly disagree) was applied into assess geosciences learning in the field. Utilizing Package google documents-based research questionnaire and Excel chart graph.

Table II: Assessment instrumentation utilized various field stages

Steps	Materials	Constituency
Mobilizations step	Field permission	Teacher/researcher
	Planning and expectation deadline	Research / students
Field camp work	Rock samples, basin type, aerial map	Students/researcher
	Field guidelines inclusive coordinates	Teacher and students
Study terrain unit	Learning outcomes report	Researcher/ students
	Brief research-based questions	Students



Fig. 6: visualizing texture and physical features of rock using lens



Fig 7: Weathered limestone associates with K-feldspar



Fig. 8: Students gathered understanding usage of GPS



Fig. 9: Abdirashid accurately utilize magnifying lens

Local geology of the area

El-adde the topographic expression of the area, occurred at hill terrain, while a long hill trending NNE direction, which is the most northeast ranged of Paleocene and Eocene time scale. Simultaneously hill



Fig. 10: Topographic area



Fig. 11: Administrative map of Sanag region, Somalia

range parallelism hills beside it, and mostly are gypsum content. the region was popular mineralization and some artisanal mining processed at milxo, golis, mountain roughly 400km at study area. the terrain appropriates the plateau region is crossed by numerous shallow valleys and dry watercourses. Annual rainfall of El-adde is lesser than in the Northeast (Erigabo). And there are flat areas of arable land that provide a home for dry land cultivators. most important, following springs and stream features and well, which constructed by central government 1970s that predominantly-nomadic Pastoralism populations utilize to consume camels and watering slight irrigation.

The outcrop image shows the repetition Carbonate rocks Limestone and GYPSUM beds over stratigraphic thickness about 10m. Working through the outcrop, we observe the following sedimentary and stratigraphic associations:

1. Each package of first laminated Dolostone, ripple-bedded gypsum (2-3m thick)
2. For each package, working our way upward, the proportion and thickness of limestone beds increases; the upper 1-2m are predominately Evaporite.
3. With the increase in the proportion of limestone beds is a concomitant increase in grain size, from fine-grained to coarse-grained gypsum.
4. The size and frequency of cross beds increases upwards.
5. Chronostratigraphy ranges from Pliocene to Miocene.
6. Hence associate anhydrite rock detached.

Therefore, the specific chronostratigraphic group (a) at coordinates Latitude 10.453900N, Longitude 48.027880E formed early to Middle OF Eocene. Then the formation noted as Taleh formation according to geology of Somalia.



Fig. 12: lithostratigraphy

Stratigraphic correlations

The following stratigraphic succession is taken largely from the Geological map of Somalia (U1H2P, 1972a). Alterations, explanations and changes are from several- other sources, UNDP (1972b and 1973a). Osman and others (1976), Hill and others (1977) and Greenwood (1982). We use this succession mainly because it is used on the latest available geological map of the entire country, and not because it is necessarily the best or most complete. Several alternate systems have been compiled which are probably equally valid. In general, the stratigraphy of Somalia and in El-adde, Sanag region is poorly understood, and based on minimal field research. following the best captured image that shows the stratigraphic cycle some minerals and Mollusca fossils were identified.

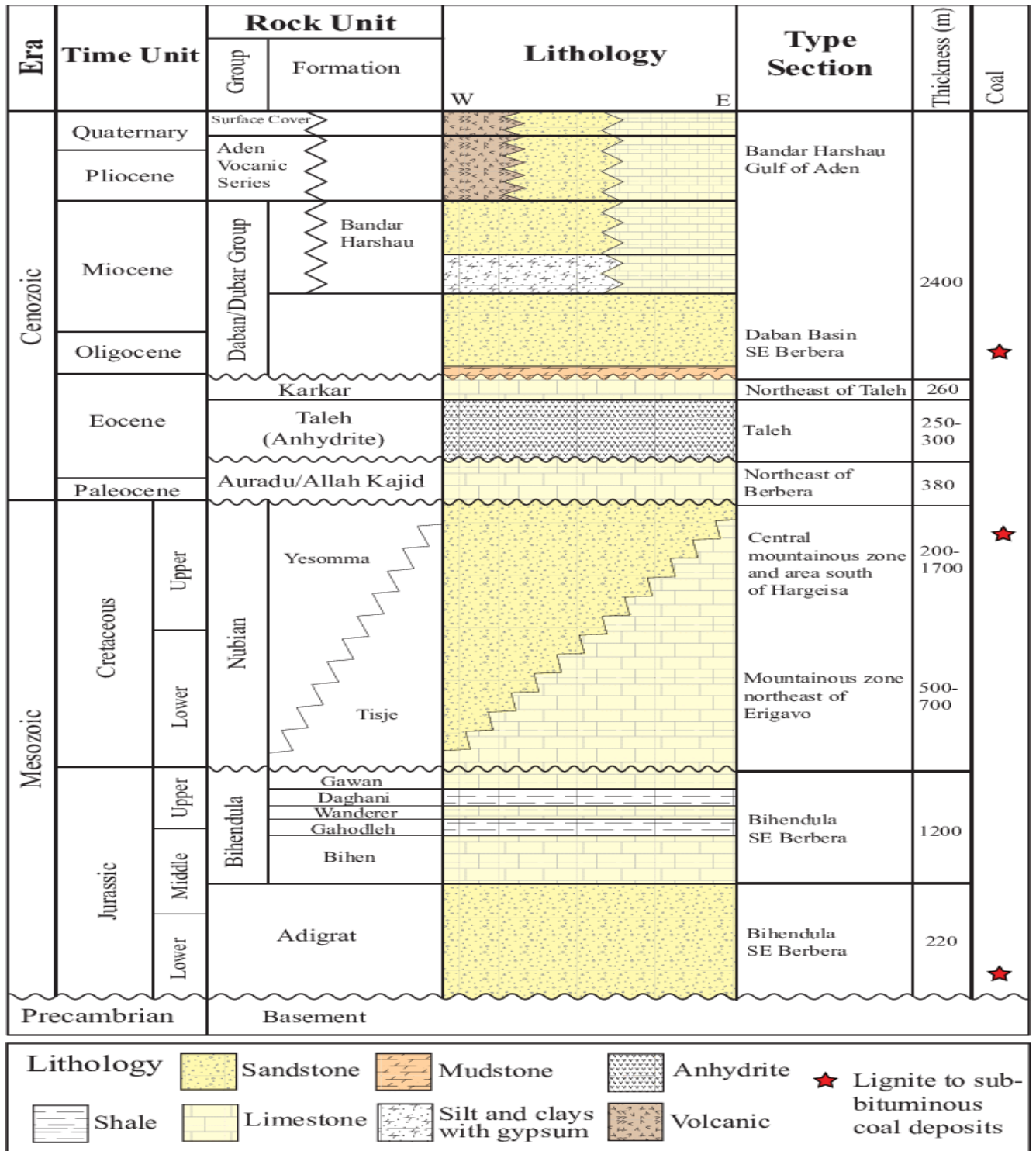


Fig 13: stratigraphic correlation of Northern Somalia -showing -stratification occurrences are limestone

Table III: Questionnaire Scoring students and researchers were based on merits and demerits of the geological survey Strengthening

Subtitled	Respondent				
	I	II	III	IV	V
	Agree	disagree	Neutral	Strongly agree	Strongly Disagree
A. mobilization unit, logistic, and Student preparation deadline.	72.7%	9.1%	3%	9.1%	6.1%
B. correlation of field trip notes and regular classes lectures	78.8 %	3%	6.1%	12.1%	0%
C. Student cohesiveness, group wise indicates separate coordinates	78.8%	3%	6.1%	12.1%	0%
D. Teacher support	70.6%	5.9%	25.9%	17.6%	0%
E. Materials and environment, comprehend and advantages.	52.9%	2.9%	5.9%	26.5%	11.8%

- The scoring were conducted a research questionnaire took the abnormal and above values for total questions of piece subtitled were computed respective number of materials. The interval thickness of
- slide subtitled was segregated including the number of questioners. Each forming it is own limits.

Table IV: Descriptive some Minerals and petrogenesis classifications of the study area. Whereas, identified Physical properties and obtained collective shared ideas by experienced Petrologist and Mineralogist. Thus, sample collected found certain area within context of the field contact.

PETROGENESIS	MINERAL
1. Gypsum	1. Calcite (CaCO ₃)
2. Limestone	3. Agate (SiO ₂)
4. Anhydrite	2. Magnetite (Fe ₃ O ₄)
5. Sandstone	3. Haematite(Fe ₂ O ₃)
6. Chert (Mg ₃ Si ₄ O ₁₀ (OH) ₂)	4. Talcum
7. Conglomerate Cu ₂ CO ₃ (OH) ₂	5. Copper (Cu) intrusion
8. Gastropod fossil	6. Malachite
9. Ark shell fossil	7. Almandine garnet Fe ₃ Al ₂ (SiO ₄) ₃

Detailed of the effective outcomes

Depending on the results of evaluation tool, the following analyzes are presented. The contents of the answers to the class report and the answers to the simple questionnaire. Followed by the Rocks and minerals naming with use of physical properties. This final step was taken to ensure the coding and descriptive process. And data identified into broader, which allowed better analysis of the study and drawing conclusions.

Learning outcomes report

Concentrating profile and by assessing written learning outcomes, it can able to accomplish which field work improve the student's education hobby, especially towards application from topography and geology map, and geological compass. A writes in the report "there were, strategy activities differing in general to catch attention and favors for students." And "undergoing field work variation assignment undertaken with

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spontaneity, an appropriate partition of student was taken into the climatic enthusiasm places was observed.” The attendee observer said “field activities may attract interest of robust applicant to join without hesitation for geology department of SNU.” corroborated perception, ‘learner’s obstacles using the compass in Prefield activity, frequently asked to described surrounding relief features, and aerial variation of lithology’”. In my views, field work interestingly mutual assistance and collaborative work among students’. Field work intensify desire and curiosity even though eagerness to understand facilitate interpretation. Furthermore, field work provided student initial relationship between theoretical aspects previously taken during the class and geological aspects observed in the field.

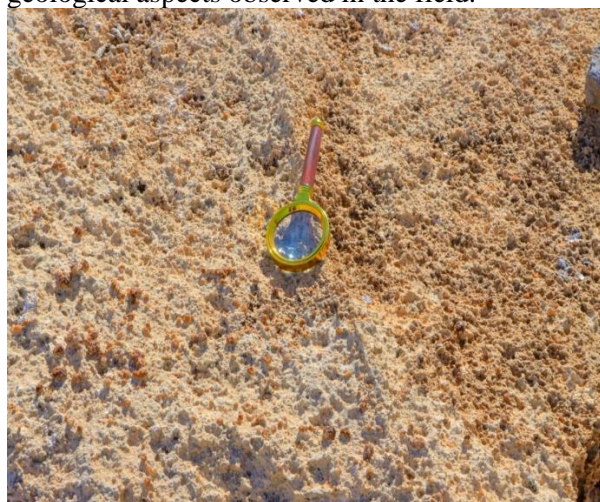


Fig. 12: Almandine garnet

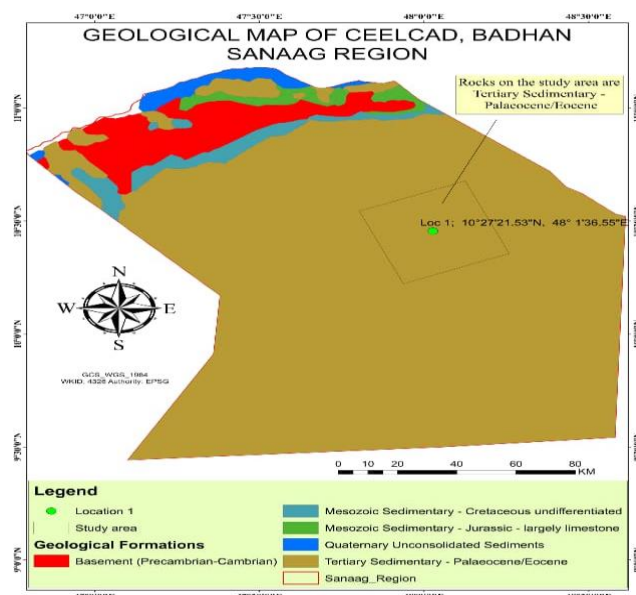


Fig.13: study area map

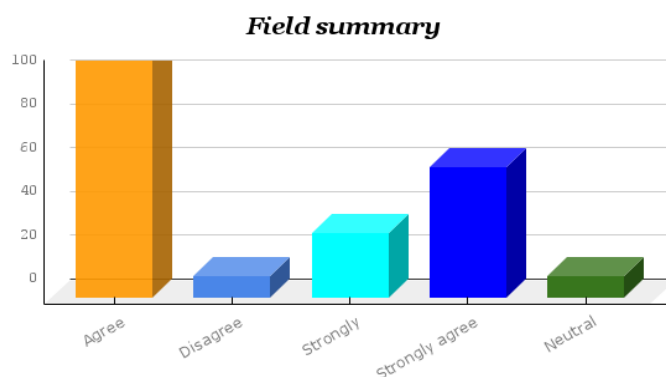
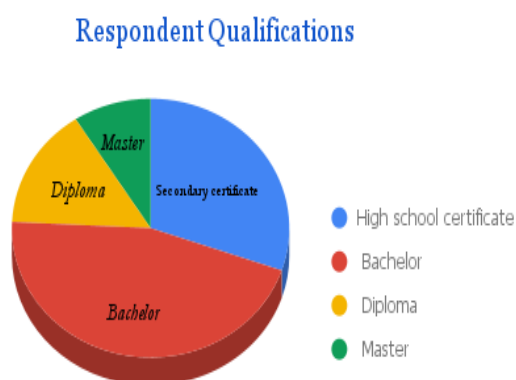


fig.The geological field was much desirable and useful than class lectures

Brief-based research Questionnaire

Reponses of student’s questioners articulate that student beneficial Field camp, because it upgraded best comprehend of geoscience exclusively in Somalia and nearby geomorphologic places. Following the frameworks plot chart of respondent qualifications and answers based on the research questioners will appear below the paragraph.

Results obtained from scoring the answers for semester-four Geology department at SNU. Presented high frequency of almost all scales: Student cohesiveness 91% combination percentages agreed and strongly

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agree, Materials and environment, comprehend and advantages 79.4% ranked combination percentages agreed and strongly agree. it reflects admiration of the field trips respectively in Geoscience education.

CONCLUSIONS AND RECOMMENDATIONS

Evaluation of Geology at Somali National University, as a fulfilling pre-requisite of the semester syllabus contents of Basin analysis and general geology teaching planned domestic area. Assessment underlined the merits of field in the geoscience's curriculum. Intense, the outcome results of this study clearly demonstrate field studies provide an effective meaning of sharing knowledge to students, as well as help them learn about geology and communicating environmental aspects. Researcher and teacher were able to clarify content knowledge learned in the classroom by establishing comparisons with related phenomena observed in the field, which defined the developments of the students' conceptual knowledge and understanding, as well as some science procedure. Moreover, an improvement in the studies awareness of the need to preserve geodiversity was noted, especially that region surrounding university. The results also showed that the field studies organized by geology department accomplished appropriate results expected.

Instructional and can create a precise learning environment, discussed in studies conducted in the region. Such, the study recognizes the need for curriculum designers to consider the inclusion of each course syllabus. At the conclusion, in generally recommended strengthening geological survey and particularly objectives based on case regards topographic area of El-adde Some geological formations that seemed abundant of mineralization, and forecasting future deepen research that requires more scholars conduct sophisticated investigations. Eventually suggest ministry of petroleum and mineral resources and Somali National University associates whomever desire, and international partners should communicate for further reconnaissance of the study area. Perhaps, it may have abundant high grade of economic and geological prospective. Galvanized surface on macrostructure, plateau is characterized El-adde terrain.

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