Developing Undergraduate Students' Geography Learning Skills during Fieldwork and Their Attitude toward It

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Abstract

This study identified the developing of a range of students' geography learning skills and the change in their attitudes toward fieldwork as a consequence of leaning experiences that occurred within a field–trip. The sample of the study consisted of (27) students within a special topic course enrolled in Geography Department at Umm Al-Qura University in Saudi Arabia in semester 2, 2018. A range of students' geography learning skills were measured by the skills questionnaire that consisted of 12 geography skills after completing field work. Changes in students' attitudes towards fieldwork was measured through a modified version of Boyle et al.'s (2007) attitudes instrument at the beginning and at the end of the field trip. Interviews were used to enhance the studies' instruments as a data gathering technique. The findings of the study showed that students developed the all geography learning skills, where more than 95% of students felt that they developed their basic problem solving, sampling, measuring & recording, survey methods, information gathering, data analysis, safety and communication & transferable skills. While 92% of students developed observation and integration skill, 90% developed identification skills, 89% developed experimental design skill, and finally, 76% developed interpretation skill. The students increased their enjoyment ($t=12.77$, $p<0.001$) as a consequence of doing fieldwork. A similar result was produced for collaboration ($t=14.44$, $p<0.001$) over the field trip. The students' responses of interviews questions supported quantitative results.

Keywords: developing, undergraduate students, fieldwork, geography-learning skills, attitudes.

تطوير مهارات تعلم الجغرافيا لدى طلاب البكالوريوس من خلال العمل الحقلي واتجاهاتهم نحوه

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المستخلص

هدفت الدراسة الحالية التعرف إلى تطور مهارات تعلم الجغرافيا لدى طلاب البكالوريوس واتجاهاتهم نحو العمل الحقلي كنتيجة لخبراتهم التي مارسوها في الرحلة الحقلية. وتكونت عينة الدراسة من (٢٧) طالب مسجلين في مقرر موضوع خاص بقسم الجغرافيا في جامعة أم القرى بالمملكة العربية السعودية خلال الفصل الدراسي الثاني من العام ٢٠١٨م. وتم استخدام الاستبانة التي تكونت من (١٢) مهارة جغرافية لقياس تعلم الطلاب لهذه المهارات، ووزعت الاستبانة بعد إكمال الطلاب للعمل الحقلي. اما التغير في اتجاهات الطلاب نحو العمل الحقلي فقد قيس من خلال النسخة المعدلة من مقياس بويل وآخرون (٢٠٠٧) قبل بداية العمل الحقلي وبعد الانتهاء منه. أيضا استخدمت المقابلة غير الرسمية كأداة ثالثة لجمع البيانات وذلك لتدعيم النتائج الكمية للدراسة.

كشفت النتائج أن جميع الطلاب طوروا مهاراتهم الجغرافية، حيث لوحظ أن سبع مهارات جغرافية وهي: حل المشكلات، وأخذ العينات والقياسات وعمل التسجيل، وطرق إجراء المسوحات، وجمع المعلومات، وتحليل البيانات، والسلامة من المخاطر الحقلية، والتواصل قابلية التحويل تطورت لدى أكثر من (٩٥%) من الطلاب؛ بينما أجاب (٩٢%) منهم بتطور مهارتي الملاحظة، والتكامل؛ في حين أن مهارة التعرف على الظاهرات الجغرافية تطورت لدى (٩٠%) من الطلاب؛ بينما شعر(٨٩%) بتطور مهارة تصميم التجارب الجغرافية؛ وأخيرا مهارة التفسير الجغرافي أتت بنسبة تطور بين الطلاب وصلت إلى(٧٦%). كما أظهرت المقارنة بين القياس القبلي والبعدي للاتجاه في محور الاستمتاع عن فروق دالة إحصائيا حيث بلغت قيمة (ت=١٢.٧٧، $\alpha \geq$ ٠,٠٠١) لصالح القياس البعدي مما يدل على ارتفاع مستوى استمتاعهم كنتيجة للعمل الحقلي، وكذلك فروق دالة إحصائيا في محور العمل التعاوني حيث حازت قيمة (ت=١٤.٤٤، $\alpha \geq$ ٠,٠٠١) لصالح القياس البعدي ويستنتج منه ارتفاع مستوى العمل التعاوني الحقلي بين الطلاب خلال الرحلة. وقد أكدت إجابات الطلاب عن أسئلة المقابلة غير الرسمية نتائج الدراسة الكمية.

الكلمات المفتاحية: تطوير، طلاب البكالوريوس، العمل الحقلي، مهارات تعلم الجغرافيا، الاتجاهات.

Background

Knowledge, according to theory of constructivism, assumed that it is built up by students as they try to understand new information and experiences. Students vigorously comprehend the world around them, incorporating new information into what they previously know. Through this way of constructing meaning, the prior knowledge they have affects the manner they review new information and their following construction of mental models (Kneppers, Van Boxtel & Van Hout-Wolters, 2009). The definition of prior knowledge is that everything students aware of or accept, "whether positive or negative, accurate or inaccurate, real or imagined, verifiable or non-verifiable" (Alexander, 2006, 72). It indicates that prior knowledge has to work with the domain content (theory), also with practices, interests and evaluations regarding this domain content (practice). For instance, a student might be aware of the definition of precipitation as a concept (theory), but he similarly might pass through the experience of embark on his bike in the rainy day (practice).

In the environment of constructivist learning, students are in need for freedom to discover more and inquire about their prior knowledge through new information processing and generating new meaning. Meanwhile, students are apprentices in the domain, and consequently they need structure and help to differentiate the central and precise domain knowledge from superficial and imprecise information (Alexander, 2003; Day, 2012).

There is a single method to give students both structure and freedom is through working with a core curriculum

(Applebee, 1994). Based on Applebee's view (1994), a core curriculum introduces core conceptions for classroom dialogue within a convention of a specialty like geography, languages or science. Core concepts in geography are, for instance, plate tectonics, climate, globalization and urbanization. In the case of fieldwork, "core curriculum" is interpreted into one or several central conceptions, interrelated sub-concepts, instances and etc. The employment of a core curriculums gives teachers and students a central platform to participate and talk about geographical conceptions.

Fieldwork is regarded to be a key component within the geography curriculum and is supported as an effective learning environment by practically all those who are participated in learning and teaching of these specialties. Lonergan and Andresen (1988, 64) define `the field' "as any place where supervised learning can take place via first-hand experience, outside the constraints of the four-walls of the classroom setting, supervised learning can take place via first-hand experience". The UK Quality Assurance Agency (QAA) benchmark statement introduces a fieldwork definition as "active engagement with the external world" (QAA, 2002), and in this way the geography fieldtrip must not be taken as a kind of picnics, outings or class excursions (Lewis, 1968). Any activity defined as a fieldwork that confirms the standards of 'active engagement' is subject to debate. Based on this, fieldwork might involve field-teaching, field trips, field research or field camps (Dando & Wiedel, 1971). Gold et al. (1991), continue in their categorization of fieldwork to five kinds of activity:

1. Short field excursion: limited travel and time;
2. Cook's Tour: restricted activity in extended travel;
3. Residential course: extended travel and time;

4. Study tour: multi-location activity;
5. Project work: (i) learner-practitioner and (ii) participant observation.

Kent, Gilbertson and Hunt (1997) propose that the aims of any fieldwork exercise should be obviously clarified because they set forth the conditions of the kind of fieldwork and its success as an educational practice. Moreover, the plan of a fieldwork program should be incorporated into the structure and learning goals of the degree that it helps. Fuller, Rawlinson and Bevan (2000) think that the subsequent points to be main fieldwork educational aims:

• Observational skills development ;
• Experiential learning facilitation;
• Encouragement of student responsibility for their own learning;
• Analytical skills development;
• A taste of research provision;
• Kindling of a respect for the environment;
• Personal skills development;
• Lessening of barriers between staff and students on residential courses.

Fieldwork is conceived as an vital part of learning geography (e.g. Kent et al. 1997; Fuller, Rawlinson & Bevan, 2000; Pawson & Teather 2002; Fuller, 2006; Oosta, De Vriesb, & Van der Scheec, 2016; Tilling, 2018). The utilization of fieldwork as a teaching and learning mechanism is well proven, but how does this method of learning in comparison with other class- or desk-based activities in respect of its value to the educational experience? Nairn, Higgitt, and Vanneste (2000) proposed that great amount of value of fieldwork has been mainly presumed. Fieldwork offers the chance to implement notions produced in the classroom to the real world, to examine hypotheses by experimental

methods and to learn new knowledge and conceptions from first-hand observation (Hupy, Aldrich, Schaetzl & Varnakovida, 2005; Lambert & Reiss, 2014). Especially, although it supports the skills development, involving subject-specific skills (e.g. field sketching), broader generic skills (e.g. data collection and recording) and intellectual skills (e.g. problem-solving) (Cook, 2011; Phillips, 2012). The significance of handling growth of the affective domain (i.e. that field of thinking that links to emotions, views and values) is also underlined.

Fieldwork is one of the most influential and pleasant forms of teaching and learning for both staff and students. Fieldwork, within geography, is regarded to clarify positive affective reactions. It is assumed to improve social capital through group dynamics, eliminating barriers between staff and students, and making friends (McGuinness & Simm, 2005; Phillips & Johns, 2012). Also, it is regarded to kindle higher rates of attention and motivation. Proofs from educational psychology has proposed that there is an association between fieldwork and improved cognitive and affective gain (Foskett, 1999; Lambert & Reiss, 2014). Kern and Carpenter (1984, 1986) confirmed that fieldwork maximized the pleasure of geology students and the significance they gave to the subject. Boyle et al. (2007) have related the enjoyment of many students from geography, geology and environmental science fieldwork to an improvement of deep learning. As the deep learning, the motovation for learning spurts from 'within'; it is a worthy 'end in itself' and it has the characteristics of critical thinking and a sense of ownership.

On the contrary, superficial learning has an external motovation (to pass the module); it feels like an obligation, and inclines to be unimportant and lacks an understanding of

the wider picture supporting specific valuation duties (Moon, 2004). The study proposes that superficial learning inclines to happen when learners are concerned about failure, and deep learning happens when they are more stress-free and enjoying their learning (Boyle et al., 2007). For Boyle et al. (2007) fieldwork is valued because it can improve student affective response in constructive ways and therefore assist deeper methods of learning.

There are several other opinions have been introduced about the pedagogical advantages of fieldwork:

- **Fieldwork provides students with the chance to improve a series of subject-particular skills (mapping, data collection, and analysis) and transferable skills like independent learning and problem solving (Andrews, Kneale, Sognez, Stewart & Stott, 2003; Shah & Treby, 2006). Moreover, fieldwork can practically boost the progress of interpersonal skills (Boyle et al., 2003).**
- **Fieldwork lends itself to the advancement of active rather than passive methods of learning (Haigh, 1996; Kent et al., 1997). Healey and Jenkins (2000) for instance have attracted attention to the role of active experimentation in Kolb's experiential learning cycle and notice how this "has a ready connection . . . with students learning directly from the environment, particularly in fieldwork" (Healey & Jenkins, 2000, 193).**
- **Opportunities can be created in fieldwork to "connect theory with real experience" (Kent et al., 1997, 319). This emphasizes classroom-based learning by tracking it through a specific 'real world' cases. Theory and practice interrelate in a learning spiral (Fuller, Edmondson, France, Higgitt & Ratinen, 2006; Ling, 2008; Hope, 2009).**

Fuller, Gaskin and Scott (2003) have recognized negative observations of fieldwork relating to costs of residential work and time and perception. Also, students sensed some concern over housekeeping preparations and prospects that related to learning. This highlights the significance of giving advance warning of fieldwork to permit students to plan for both financial and time obligations, and maintaining learning objectives obviously and identifying the significance involved in housekeeping preparations of some students. Yet, does carefully prepared and incorporated fieldwork (even down to domestics) offer an active learning opportunity? Careful readiness is essential for fieldwork to positively involve all students.

Purpose of the study

Based on the previous discussion, the first purpose of this paper is to identify if the geography fieldwork to develop a range of students' skills and if they change their attitudes toward geography learning after completing fieldwork. The following research questions will be addressed.

1) **How does the geography fieldwork develop a range of students' geography skills undertaking fieldwork?**
2) **Do students' attitudes toward fieldwork change on completing field trip?**

Significance of the Study

Most of geographers, fieldwork for them is a main element of their interest for the topic and one of the strongest components of their own personal biography. In the current academic life, the most geographers admit the significance of fieldwork to their specialty. However, individual explanations of the practice differ broadly. Stoddart, for instance, proposes that 'real' geography may occur only in the field, where knowledge emerges from direct physical, mental, and emotional experiences (Stoddart,

1986). In the university stage, fieldwork has been seen as a crucial element of geography degree programs in UK (Gold et al, 1991).

The current government procedures stipulated that all geography students must be exposed to a particular lowest amount of fieldwork during their undergraduate programs (HMI, 1992). The involvement of fieldwork is commonly explained in respect of a loosely specified and seldom questioned a group of tangible learning objectives. Normally, these comprise skills of acquisition and reinforcement, experience- based learning, and response to the challenges of unusual environments (McEwen, 1996). This study is important as it identifies and describes transformative experiences within students in relation to their learning skills and attitudes after undertaking fieldwork.

Participants

The study population consisted of 27 students entering a geography degree program at Umm al-Qura University who participated in a Special Topic course that was presented in the eighth semester. The students' ages ranged from 19-24. All 27 students had no experience of any previous fieldwork. The students spent 4 days ~~as~~ on a field trip on the Youba valley which is located in south of the Al-Qunfothah governorate in south western ~~of~~ Saudi Arabia. It is one of famous valleys for environmental tourism. The valley is about 100km in depth it is features include a diversity of rocks, plants, swamps and water pools.

Methodology

The research was situated within the constructivist-interpretive research paradigm (Denzin & Lincoln, 2000), with multiple methods of data collection and analysis.

Data Collection and Analysis

Developing students' skills were examined through a skills questionnaire that consisted of 12 geography skills that were required from students' answers if their fieldwork experiences had enabled them to gain and extend these skills (observation, interpretation, basic problem solving, sampling, measuring, & recording, survey methods, identifications skills, information gathering, data analysis, experimental design, integration, safety, and communication & transferable skills). Students answered this questionnaire after completing fieldwork.

Students' attitudes towards fieldwork was measured through a modified version of Boyle et al.'s (2007) attitudes instrument at the beginning and end of the field trip. Only two scales embedded in this study related with the research questions. These scales were enjoyment and collaboration. This instrument uses a combination of Likert scales (three point). All items were translated into Arabic, and checked for accuracy by back-translation by an English-speaking instructor. The data were analysed with a paired t-test, with reliability values being calculated using Cronbach alpha. Due to the small sample size, the individual was used as the unit of analysis.

Students were interviewed while engaged in field activity using an informal conversational approach (Patton, 1990). The interviews were used to enhance the studies' instruments as a data gathering technique (Cohen, Manion, & Morrison, 2018). The interviews were recorded (with permission from all individuals) and transcribed later.

Findings of the Study

The results of this research are clear that there is a wide variety of skills that students developed from their fieldwork experience. These vary in range from the observation, recording and the development of identification skills,

through gaining a wider experience of the environment as a whole and thus being able to relate theory to practice, to communication and transferable skills. It has become clear that the full range of the advantages of fieldwork is multifarious in nature. Table 1 show the skills that students developed from their viewpoints. More than 95% of students felt that they developed their basic problem solving (95%), sampling, measuring & recording (96%), survey methods (95%), information gathering (100%), data analysis (98%), safety (100%) and communication & transferable (98%) skills. While (92%) felt their observation and integration skills were developed. Identification skills were developed among 90% of students, experimental design developed among 89% and finally the interpretation skills were developed by 76% of students.

Table 1: Descriptive statistics (percentage) of students' skills on the questionnaire's skills at the end of the fieldwork. (N=27)

Skill	yes	No
Observation	92%	8%
interpretation	76%	24%
Basic problem solving	95%	5%
Sampling, measuring & recording	97%	3%
survey methods	95%	5%
identification skills	90%	10%
Information gathering	100%	0%
Data analysis	98%	2%
Experimental design	89%	11%
Integration	92%	8%
Safety	100%	0%
Communication & transferable	98%	2%

skills

The majority of the students felt that fieldwork provided a very valuable learning experience. Students felt particularly that they had developed key learning skills through fieldwork and that their curiosity about the environment had been heightened. This was illustrated with the following comments:

Fieldwork developed my inquiry skills, guided design problem based learning and collaborative learning.

Fieldwork has a positive impact in my knowledge.

Following the field experience, I was more likely to claim that 'fieldwork is an activity I enjoy.

I like to be challenged in fieldwork.

Fieldwork is very effective tools for applying the lesson's concepts and communicating with students.

Fieldwork helped me to record hypotheses, record, measuring, collect data, and process the data easily in a variety of ways, enhancing the knowledge and understanding that could be achieved.

Fieldwork assisted to solve problems in the field.

Learn new skills and improve on others, get to know other students better.

The greatest value of field trip lies in of hands-on experience complementary to subject theory via the use of data processing and analysis.

Regarding ~~to~~ students' attitudes toward fieldwork, these were assessed using a modified version of Boyle et al.'s (2007) attitudes survey instrument at the beginning and end of the field course. This instrument explored students' attitudes on two scales: enjoyment and collaboration.

Table 2 shows the mean, standard deviation, t-test, and effect sizes for both scales. Significant differences ($p<0.001$)

were found between the pre- and post-questionnaire means for both scales. As shown in Table 2 the mean pre-questionnaire score for enjoyment was 2.55 and 4.09 in the post-questionnaire. This indicates that students have more enjoyment as consequence of doing fieldwork. A similar result was produced for collaboration. The mean score for collaboration was 2.62 in the pre-questionnaire and 4.23 in the post-questionnaire. This result suggests that the field experience strengthens positive affective responses to group work, though there are still students who prefer to work alone.

Table 2: Descriptive and inferential statistics of students' attitudes scales on the pre- instrument and post-instrument as measured by a modified version of Boyle et al.'s (2007) attitudes instrument at the beginning and end of the fieldwork. (N=27)

Scale instrument	Number of items	Pre- instrument		Post-			
		Mean	SD	Mean	SD	t-value	Effect Size
Enjoyment	7	2.55	0.42	4.09	0.52	12.77***	3.29
Collaboration	5	2.62	0.39	4.23	0.52	14.44***	3.50

***p <0.001

The results of informal interviews support the quantitative results. Enjoyment is clearly something which students value ~~on~~ in fieldwork. The students stated in their comments that they believed their attitudes

had changed in a positive manner as a consequence of completing the fieldwork. The new views of fieldwork that the students developed over the fieldwork were a major component in changing their attitudes towards social studies and fieldwork. Through participating in the fieldwork activities, the students saw fieldwork in a different manner. Fieldwork was seen as being enjoyable, interesting and exciting, rather than unlikeable, boring, and depressing. Comments from the students are provided below to illustrate the new views of fieldwork.

Doing this fieldwork trip there was reduced anxiety. Fieldwork activities were very fun and can be easily simplified.
I have a more positive attitude to fieldwork. I have always enjoyed it.
I really enjoyed the trip, mostly the visit to valleys.
Learning whilst enjoying doing the work in a relaxed environment.
I enjoyed everything.

Participants enjoyed placements with another student or peer, appreciated learning contracts, and appreciated fieldwork settings where their learning needs were taken on board and addressed. They felt that they learnt most in settings where students were valued and regarded as part of the team. Thus, there was often more opportunity to apply theory to practice. As a result, there was,

'Lots of opportunity to get in there, to feel part of the team and feel valued.
Getting to know people better and working in-groups.
Interacting with other individuals in an organized group and meeting other people.

Working as a group when doing practical things such as measuring or recording.
Working in a group and getting to know students that I wouldn't normally work or socialize with.

Discussion

Fieldwork is extensively viewed as a necessary component of geography education. It refers to one of the most influential and enjoyable types of learning of students. Students have confirmed very positive emotional reactions to fieldwork. The field experience inclined to develop high levels of self- reliance, both in students' ability to encounter the challenges of fieldwork, and in beliefs that fieldwork is valued academically, in addition to enhancing many learning skills such as observation, recording, measuring, data collection and analysis. Cook (2015) argues that fieldwork will enable students to develop skills that traditional fieldwork techniques may not provide. Fieldwork can challenge the mindset of those experiencing it – and more specifically those responsible for leading the learning experience. Fieldwork motivates students to regard how vision, sound, touch and smell effect their emotional reactions to diverse environments. Exploring fieldwork is possibly the most experiential because the whole trend and concentration of a study must emerge from a student's impulsive interaction Practically, it is with an environment (Cook, 2011). essential for students to observe and be part of interpretive geography, where variables cannot be strongly controlled and where opinions need to be taken into consideration (Lambert & Reiss, 2014). Fieldwork, is usually attested, plays a vital part in providing real-world related content, improving technical skills and is a significant experience of research procedure and design. The ability to subject conceptual and theoretical perceptions to the test of experimental proof and

faces with actual people and locations is the behold the strength of fieldwork (Munge, Thomas & Heck, 2017). Berg (1994), for instance, thinks of the normative variation made between conceptual understandings and empirical encounters in the field. Introduce the problem that has been studied in the classroom and lecture theatre through experimental observation and examination has constantly been the main explanation for fieldwork. However, the division between these two methods of knowledge is random in his considerations on fieldwork (Mcguinness & Simm, 2005).

The health and security of the partakers is the most significant side of fieldwork. The establishing of 'safety culture' is covered by the attitude that all partakers have a task to take care of themselves and others. Nevertheless, the mechanisms of the way of fieldwork risks are ran may differ significantly between higher education establishments and between academic departments and schools. Contemporary initiatives from several establishments like the British Standards Institute have worked to stimulate a more organized method to field safety and training (Couper & Stott, 2006). Couper and Stott (2006) propose that experienced leadership while in the field, and the continuous involvement of decision making is the most significant safety element of all and that this must be shown in the method to field safety training.

Specific social advantages resulting from fieldwork form greatly valued soft results of the study of geography at school. Fieldwork involves students in the repeated processes of drafting and redrafting data collection instruments also analysis and drawing conclusions; which means the states in

which students learn one from the other and from teachers (Lambert & Reiss, 2014).

This study, remarkably, defined the significant role that a fieldwork may play in the students' induction process especially that is related to convene with staff and duty group work. The results of the survey show that the field knowledge reinforces positive affective reactions to group work. Group work is usually a more eminent characteristic of the fieldwork learning experience than most campus-based curricula (Fuller, 2006; Lambert & Hopkin, 2014).

Enjoyment is obviously something that students evaluate in fieldwork – it is a pleasant method of learning. The outcomes of this paper refer to that students are more enjoyment and more collaborative as a result of doing fieldwork. Many researches have shown that fieldwork may have a significant effect on student learning through its influence on the 'affective domain' (Stokes, Mather & Griffiths, 2006; Boyle et al. 2007; Elkins & Elkins, 2007). The affective domain tackles emotions, feelings and values; they reach to that observations of learning duties can have a deep effect on a student's impetus and performance. Thompson (1982) defined the development of 'interests and attitudes' among the main goals of geological fieldwork, while Kern & Carpenter (1984) and Boyle et al. (2007) have confirmed the possibility of fieldwork to produce positive affective responses in students.

The students in this paper appreciated the chance to forge a close relationship with their colleagues during the field trip, even if there are no activities for the groups. It might look that geography fieldwork should run definitely in a group-learning framework, or merely as a bussed field trip offers

improved chance for social interaction among the group who are travel together for a day. This is essential especially in an environment in which students may meet one another irregularly, as they study a series of different topics (Ling, 2008; Day, 2012).

Conclusions

Fieldwork seems to be an influential mechanism to enhance learning skills, social integration, and improving students' confidence to work with their colleagues. Nevertheless, the significance of fieldwork is still evidently acknowledged by most geographers, and its status, though at a possibly minimal level, in the curriculum is certain. With the help of an influential design and management with an obligation to the educational and personal benefits to students of fieldwork, geography teachers is able to ascertain that it becomes one of the most important learning practices that students experienced during their school time.

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