Chapter 7
The Current State and Issues of Field Research in Japanese Geographic Education

Shunsuke Ike

Abstract The National Curriculum Standards emphasizes field research outside the classroom. Yet the number of teachers who actually engage their students in this activity has declined considerably because it takes too much time to prepare and plan. The author argues that two actions are needed to raise the implementation rate of field research in classrooms. The first approach is to be clear about the value of that research to learning, which cannot be replaced by classroom teaching. Second, prior to taking on a teaching job, teachers need to experience and learn the best practices to introduce, and to strengthen the link between field research and geography content.

Keywords Field research • Geographic characteristics • Geographical skills • Local area

7.1 Introduction

"Geography is a study of the outdoors," a statement espoused by my former teacher and written on a blackboard in my first geography class at senior high school. Geography is based on outdoor activities and field research, although research topics are diverse.[1] Geography is a field science that values outdoor research activities as a form of investigation. Therefore, undergraduate and graduate education has invested substantial time and energy in the cultivation of skills necessary for conducting field research outside the classroom. The Association of Japanese Geographers established the accreditation system of "Field Researcher" and "Field Research Specialist," endeavoring to train specialists who engage in field research.

[1] Inquiry survey often occupies an important place in human geography, whereas observation is highly valued in physical geography. There are many levels of inquiry survey, ranging from simple research in which investigator collect data according to the fixed questions to advance research with a task of comparative culture, requiring researchers to view themselves objectively as represented in Ohno's study (1974).

S. Ike (✉)
Waseda University, 1-6-1 Nishiwaseda, Shinjuku, Tokyo 169-8050, Japan
e-mail: ike@waseda.jp

Y. Ida et al. (eds.), *Geography Education in Japan*, International Perspectives in Geography 3, DOI 10.1007/978-4-431-54953-6_7

The importance of field research is demonstrated by its inclusion in the National Curriculum Standards, which stipulates its implementation in geographical education from elementary to senior high school. The curriculum emphasizes field research, with mastery of conducting field investigation. Despite its inclusion in the national guidelines, Shinohara (2001) pointed out that field research is not popular in schools. Teachers of Geography and History, and Social Studies fail to fully understand the importance of field research. In this paper, the author presents the current landscape of field research from elementary to junior high and high school levels. In the process, tasks for outdoor field research are examined, its significance in schools explained, and suggestions are made to revitalize its favor in schools.

Although field research involves a variety of indoor activities such as literature research, statistical analysis, and the collection and analysis of maps, the core of this research is fieldwork, characterized by observations that include all sensory input. Thus, the term "field research" tends to be used synonymously with fieldwork. Distinguishing the two, however, the author focuses here on field research, especially on fieldwork. In the world of geography education, fieldwork tends to include activities such as field trips and excursions,[2] in which a director or guide plays a key role (Inui 2009). Therefore, this paper also groups these activities as fieldwork.

7.2 The Reality of Field Research in Elementary, Junior High, and Senior High Schools

7.2.1 Elementary School

Among the Social Studies classes taught in elementary school, field research was ranked the most important within community study for third and fourth grade students. The new National Curriculum Standards ask students to "observe and investigate social events through the study of a local area, a municipality and a prefecture, to cultivate the ability to use maps and a variety of concrete materials effectively". This includes thinking about the characteristics of social events within a community and their associations, and communicating the results of students' independent investigations (MEXT 2008a). Together, these indicate that implementation of field research is strongly called for in community study.

A relatively large number of elementary schools conduct field research in the third and fourth grades. For instance, a 1992 questionnaire survey of third and fourth grade teachers across 152 elementary schools in Kagawa Prefecture found that field research, on average, took place more than 3.5 times annually, and only four schools (3 %) failed to conduct any field research (Shinohara 2001). *Machi-tanken* (town expedition), which studies a community or municipality, was the most popular type

[2] Excursion refers to an activity in which participants visit a local place with a tour guide to observe its geographic phenomena.

of field research. Students observe and investigate topography and land use in their local areas, and there are opportunities for them to note local differences in the state of a district (geographic characteristics). In another study, a survey showed that 95.9 % of third-grade teachers in the city of Yokohama conducted field research in social studies (Matsumura 2011). The rate of field research implementation tends to be higher in elementary schools than at higher levels, because teachers in the former schools have more discretion to change the curriculum. Given this flexibility, they can decide to allot many uninterrupted hours to Social Studies.

Nevertheless, according to Shinohara (2000), many teachers believe that they fail to meet children's' demands for and keen interest in outdoor activities, owing to their own lack of skills. Many teachers are at a loss at how to teach geographic characteristics through field research. Thus, they often rely on Social Studies supplementary reading material prepared for the *Machi-tanken* class by each municipality. These reading materials, which put emphasis on learning development, have been popular recently. The demand comes from teachers who have insufficient content and pedagogical knowledge about a local area, especially for instruction in field research (Ike 2008). These teachers often lead outdoor activities with unclear goals and teach only superficial skills, such as how to take a compass bearing and recognize map symbols. Some teachers appear to shun the field research needed to understand the state of a district. This causes concern that field research, although included in the National Curriculum Standards, is not followed in the classroom.

7.2.2 Junior High School

Social Studies in junior high school consistently stress the implementation of field research, at the least the study of a local area. The latest National Curriculum Standards also set a goal to "enhance students' interest in geographical phenomena through concrete activities such as field research and to develop abilities and attitudes that enable them to think from various perspectives, judge fairly geographical phenomena by selecting and making use of various materials and express them properly" (MEXT 2008b, p. 29). In particular, the "investigation of a local area" primarily aims to deepen student understanding and interest in a local area through observation and investigation, and to help them master the perspective and method for investigating an area on the scale of municipalities (MEXT 2008b, pp. 66–67).

There are few teachers, however, who actually conduct field research even though it is expected that students actively implement it during their investigation of a local area. Empirical support comes from a questionnaire that surveyed 67 public junior high schools (128 teachers) in Miyagi Prefecture. Approximately 75 % of teachers answered that they only teach students how to read a map without going outdoors, and only about one-third of teachers lead students in conducting field research (Miyamoto 2009). This survey revealed that the major reason teachers failed to undertake field research was that they did not have enough time to prepare for and implement that research. This finding highlights the reality of teaching in

junior high school. Teachers simply do not have enough time to improve the quality of course instruction because they spend their time instructing extracurricular activities, addressing students' behavior outside school, and executing other school responsibilities.[3] In examination papers, it is unlikely that senior high school students are tested on investigations of a local area; instead, they answer questions about reading a topographic map. As a result, most Social Studies teachers assume that students would not have trouble answering questions about local area investigation if they master map reading. This assumption is incorrect and contributes to the low implementation rate of field research.

7.2.3 Senior High School

The National Curriculum Standards emphasize the implementation of outside fieldwork, not only in elementary and junior high schools but also in senior high schools. The curriculum also expects that "students discover geographical phenomena by themselves, set an agenda, and carry out an investigation by adjusting research methods," using "geographical tasks as outlined in Geography A (MEXT 2010). For Geography B, it also states in "various maps and geographical skills" that students "must master geographical skills that conduct research on areas in which they can investigate directly, using maps from various perspectives and capturing geographical characteristics of living space" (MEXT 2010, p. 101).

Nonetheless, the implementation rate of field research is unexpectedly low even in senior high schools, despite the expectation that students at this level actively engage in field research. Low student participation was recorded in a 1990 survey, with responses from 66 geography teachers at public senior high schools in Ehime Prefecture. The findings indicate that field research was minimally implemented, if at all. However, 29 teachers (44 %) said that they introduced field research in their classes (Shinohara 2001). Field research in the prefecture was conducted in schools from 1963 to 1981, when geography was a compulsory or compulsory elective subject. Since then, however, many geography teachers have stopped conducting field research because they became very busy with a heavy schedule of school events, and student guidance and career counseling (Shinohara 2001). The most important factor causing the decline of field research was the difficulty teachers have had incorporating it into the school curriculum since geography became an elective subject. Therefore, the overall rate of field research implementation (including excursions) is low, although some geography teachers are dedicated to continue field research, as they believe that it reaps clear benefits.

[3] According to a questionnaire survey of 67 junior high schools in Kagawa Prefecture in 1992, only 15 schools carried out field research, and many merely asked students to read topographic maps (Shinohara 2001).

7.2.4 Causes for the Unpopularity of Field Research

Inui (1990) pointed out seven factors why the field research implementation rate was low: (1) Schools were increasingly concerned with accident prevention; (2) there were obstacles from specific environment factors around the school; (3) a lack of time for research implementation, because of an overcrowded curriculum and time allocated to university entrance examination preparation; (4) geography became an elective subject; (5) the length of time required to prepare for field research; (6) lack of a budget for travel expenses; and (7) a lack of teacher leadership. These factors vary by school. However, the fact that elementary school teachers are not sufficiently acquainted with the knowledge and methods of field research, and that junior high and senior high school teachers are too busy to arrange sufficient time for preparation and implementation of such research, are considered key reasons for a paucity of research in schools.

A number of factors explain teachers' failure to conduct field research. There is low teacher motivation for its implementation, although other factors such as institutional problems and lack of a supportive environment for field research play a role. Therefore, the first thing we must do to enhance the implementation rate is to help teachers understand the significance of field research. That is, we must answer basic questions such as "why is it necessary to introduce field research in the geography class?" and "what are the educational effects of field research that cannot be acquired in an in-class lecture?" To this end, the author discusses the significance of field research in the study of geography in the next section.

7.3 Significance of Field Research

Many researchers have pointed out the significance of field research in geography education (e.g., Shinohara 2000; Takeuchi 2002; Akimoto 2003; Inui 2009). Based on these studies, here the author advocates five factors that represent the value of field research.

First, students are likely to learn new characteristics of a local area through field research, which may enhance their motivation to learn geography. In such research, the subject of investigation is a "local area," i.e., the students' daily living space. Students often recognize this area as an ordinary, familiar, and mundane place. This attitude is likely to diminish their drive to learn (Shimura 2009). However, many discoveries and tasks that may be missed in their daily lives are often hidden in their living areas. As Ida (2000) points out, children are really impressed to learn that occurrences in a distant country can also be found in their local region. Such an unexpected finding, uncovered through field survey, motivates students to learn more about geography. Thus, field research is usually required at the start of a geography course so that students discover via experiential learning.

Second, it is easy for students to master the ability to discern geographic characteristics through field research. As Ukita (1970) indicates, a micro region such as a local area has different geographic characteristics that are interconnected. Therefore, it is generally easy to determine connections between various phenomena in a micro region. For instance, children have difficulty understanding the process by which agricultural products are delivered from producers to consumers when they only learn about Japan's distribution system on a macro level. At a micro level such as a village, it is comparatively easy to investigate the overall flow of a farmer's distribution of agricultural products to a greengrocer through a wholesaler. In this way, it is easy to recognize connections between phenomena in a micro region. To reveal geographic characteristics, we must focus on connections between different elements in a region. On this point, it is easier for students to identify such connections, through field research, between regional elements in a micro region than in a macro region. This can also be a fruitful training ground for the observation of characteristics in a macro region.

The third significance of field research is that it can be a yardstick for comparing regions. The learning as well as the experience from field research and direct observations provide a benchmark for studying regions inside and outside Japan. For example, if students can picture the size of a 1-hectare farmland through field research, they can accurately imagine the size of farmlands in a foreign country. Knowledge and a comparative ability acquired from field research can also function effectively as a standard of comparison when students try to understand the culture and social structure of another region. In addition, these experiences contribute to students rethinking the value of a local area through observation from a larger perspective.

The fourth factor is that field research provides a means for students in a geography class to learn geographical skills. Field research gives students the opportunity to observe scenery, learn fundamental research skills (e.g., reading and drawing a map, interviewing skills), which are difficult to learn in the classroom. In the classroom, a typical lesson on topographic maps takes place on a desk. Generally, students read contour lines and decipher the meaning of symbols. Route finding, however, a practical skill in real life, is difficult to acquire in the classroom. Thus, field research offers an authentic environment for students to master practical these geography skills.

The fifth benefit of field research is that it compensates poor childhood experience. As Takeuchi (2002) reports, children's perceptions of the social world have become distorted because many do not have natural and social experiences across a variety of settings.[4] The mass media also highlights children's underdeveloped space perception, self-centered thinking patterns, and a narrow-minded sense of value. These patterns are influenced by the changing environment in which children live, such as the trend toward the nuclear family, popularization of computer games, and the collapse of regional society. Students have an opportunity to learn about diverse values and life experiences outside these indoor situations through field research where students are

[4] As Teramoto (2002) pointed out, children today draw maps much more poorly than children in the 1980s, showing that their lack of experience of the real world greatly affects their development of space perception.

compelled to communicate with people of a different generation and with adults in the local community. These experiences support their building of lifelong skills such as creating social and professional networks (Takeuchi 2010).

7.4 Future Challenges of Field Research

7.4.1 Issues on Field Research Content

As noted above, field research can provide students with a variety of learning opportunities not possible through classroom teaching. The author believes, however, that we must examine the following tasks carefully to effectively conduct field research in geography classes.

The first task is to examine the content and methods of field research and align them with the developmental stages of children. Empirical research on the development of individual abilities has been accumulated,[5] but aside from Inui (2009) there has been no study aimed at designing field research materials appropriate for students' developmental stages at elementary, junior high, and senior high school levels. Therefore, it is necessary to examine how best to engage field research that is appropriate to each developmental stage.

The second task is to identify ways to nurture students' abilities to research geographical issues. As mentioned above, an unexpected discovery about their local area enhances their enthusiasm for learning. However, most students lack sufficient knowledge and experience to investigate important local geographic phenomena. Therefore, we need to teach them a basic perspective for observing a region of interest carefully beforehand, so they can select a theme and discover geographic characteristics and tasks. In reality, however, most teachers fail to teach students research skills to capture geographic phenomena, contributing to thee failure to initiate field research.

It is important to help students develop a perspective and sense of the local area under study, by first examining pictures of the region (Shibusawa 1985). Excursions are also effective in developing students' geographic perspectives. These activities, which are generally conducted in university-level geography courses, are expected to have a positive learning effect on students when conducted before implementation of field research (Miyamoto 2009). It is urgent to introduce excursions in geography education at elementary, junior high, and senior high school levels, to help students foster perspectives in evaluating geographic phenomena.

The third task is to investigate the association between field research and other learning content. Shibusawa (1998) explains that geography can be learned by

[5] For instance, Toriumi (1990) revealed that first and second grade students could see geographic phenomena only fragmentally in their observation from a school roof, whereas third and fourth grade students could make comparisons between geographic phenomena and explain their spatial relationships. Fifth and sixth grade students begin to recognize and explain geographic characteristics by viewing the entire scene.

direct and indirect experiences. Given this, the author suggests that it is necessary to apply learning outcomes and experiences acquired from direct field research to other learning content (e.g., the study of various regions). For instance, local field research is a useful method for students to discover geographic characteristics of a region, which is considered a key goal of regional geography education. The basic skill of identifying regional characteristics can be used to study regions of Japan and the world. Thus, the learned skill of observing geographic characteristics through field research contributes to another performance outcome. It is hoped that field research will become a more important part of the regional geography curriculum and general education in Japan and worldwide.

It is also possible to apply the skills and knowledge developed from field research to the study of systematic geography in senior high school. For example, in the 1970s, students studying Geography A (first year of high school) in Tama Senior High School in Kanagawa Prefecture conducted field research every Sunday for 7 weeks. Weekday classes on outdoor field research were also given. The content of these classes included: Uenohara-shi (river terrace) and Kofu Basin (alluvial fan) in Yamanashi Prefecture during the first trimester (unit dedicated to the study of the natural environment); Miura Peninsula (suburban agriculture and fishery), Hadano Basin (inland industry) and Yokohama Waterfront District (industry) in the second trimester (unit dedicated to the study of agriculture and industry); central Tokyo (urban function); and the Musashino Upland (location of settlements) in the third trimester (unit dedicated to the study of city and rural settlement).[6] With so many topics covered, this is simply an illustration that field research is useful not only for regional geography but also for systematic geography and the knowledge and experiences gained from field research can be associated with other learning content (Ike 2012).

The study of field research tends to be based on a unit of learning (e.g., "The investigation of the local area" in junior high school or "Geographical problems in the living area and field research" in senior high school), which fails to provide sufficiently in-depth investigation into a topic. The casual and occasional implementation of field research is insufficient for students to benefit from its value. Therefore, it is desirable that field research be introduced at each stage of geographic learning as necessary.

7.4.2 Institutional Issues to Implement Field Research in Education

It is important to improve not only the field research content but also institutional support to reinvigorate field research. The main reason that field research is less often introduced is that many teachers are unsure how best to teach it, because they

[6] Every first-year student was obliged to participate in a 1-day field research event at least once a year. This excursion experience offered valuable information in the "Annual Report of Geography," which compiles findings of outdoor field research. See Ike (2012) for the contents of Tama Senior High School's Geography A class, which used field research.

did not learn proper methods during their teacher training. For instance, elementary school teachers usually graduate from teaching training college or school, but these programs do not offer a class that focuses on the significance and methods of field research for non-geography majors. A survey of every student enrolled in the elementary school teaching license course at teacher training colleges and schools indicated that that only 11 of 49 universities (approximately 22 %) included field research in their curriculum (Shinohara 2001). As Ida et al. (1992) have remarked, teachers who experienced field research in college are likely to include it in their classes because they understand the importance of outdoor research.[7] Therefore, the author considers it necessary to establish a requirement for pre-service teachers to learn the significance and methods of field research, by participating in compulsory teacher training on the topic.

It is also necessary to build a system whereby relevant materials and information about field research are shared among teachers. In particular, elementary and junior high school teachers spend much time preparing for field research (e.g., the development of teaching materials for local area study). With a way to share materials (such as maps and lesson plans) and best practices, teachers with little field research experience can more effectively introduce it to their Social Studies classes. However, because of the lack of such a system, new teachers are left to design their lessons in isolation, with little support and relevant materials.

Since 1989, when Geography (and Japanese History) were combined to form the course "Geography and History," it has become an elective subject. The number of students who study Geography has declined since World History became a compulsory subject in senior high school. Since then, it has become increasingly difficult to conduct field research. It is especially challenging for field research to be done in distant provinces, another contributor to the poor implementation of field research in senior high school. It is critical now to consider how to restore geography to a compulsory status, as one way to increase field research implementation.

7.5 Conclusion

In field research, geographic characteristics and tasks become clear to students through careful observation of the scenery and data collected. The goal of field research cannot be replaced by classroom instruction. Knowledge gained from

[7] Nevertheless, according to a questionnaire survey of junior high school teachers in Miyagi Prefecture (Miyamoto 2009), 19 of 128 teachers (15 %) participated in field research when they were college students, among which only 6 teachers (31 %) conducted outdoor field research in junior high school. This shows that the experience of field research in college does not necessarily lead to a high implementation rate in class. There are few teachers with college field research experience, so it might be difficult to generalize this result. However, we cannot rule out the possibility that it has become difficult to implement field research in junior high schools owing to a tightening of conditions for its implementation.

such direct research serves as a reliable benchmark to measure the influence of geography education on students' thinking in school and throughout their lives. Thus, geography teachers must introduce field research as a way to highlight geography's direct application and importance to students.

It is not realistic for teachers unfamiliar with the process and topic to follow models of field research presented in the National Curriculum Standards and textbooks. Nevertheless, a lack of prior experience and training further increases teachers' hesitation to include field research in geography classes. The author suggest that they do not need to implement a high level of field research from the beginning; rather, a variety of field research should be conducted, depending on student developmental stage and teacher educational ability. As Sakurai (1999) and Toida (2007) report, simple research is appropriate at the elementary stage, such as investigating the distribution of elementary geographic phenomena and compiling new information on a map to identify spatial relationships. The key is for teachers to introduce field research and be confident that the quality of data, experience, and lesson plans will improve over time.

The best place to study geography is outside the classroom. If teachers understand this through their own experience, students will also gradually recognize the value and attractiveness of field research. The author hope for the reintroduction of field research in geography classrooms in the very near future.

References

Akimoto H (2003) Yagai kansatsu to chosa (Outdoor observation and research). In: Murayama Y (ed) 21seiki-no chiri – atarashii chiri kyoiku (Geography in the 21st century – new geography education). Asakura Shoten, Tokyo, pp 117–122

Ida Y (2000) Ningen keisei ni okeru yagai kansatsu/chosa no igi – Daigaku ni okeru kyoshoku kamoku no jissen wo tooshite (The significance of outdoor observation and research on character formation: through the practice of teacher training courses in a university). Tsukuba Daigaku Kyoikugakukei Ronshu 25(1):71–81

Ida Y, Fujisaki A, Yoshida T (1992) Shoto kyoin yousei gakubu ni okeru mijika na chiiki no yagai chosa ni kansuru shido – Jyoetsu kyoiku daigaku no ba-ai (The guidance of fieldwork on the local area in the department for training students to be elementary school teachers: in the case of Joetsu University of Education). Shin Chiri (New Geogr) 40(2):36–48

Ike S (2008) Shichoson gappei ni tomonau shakaika fukudokuhon no kadai (Tasks of supplementary readers arising from a municipal merger). Waseda Daigaku Daigakuin Kyoikugaku Kenkyuuka Kiyo 18:1–14

Ike S (2012) Chiiki chosa wo ikashita chiri jyugyo – 1970 nendai no tama koukou no Jissen no bunseki (Geography lessons utilizing field research: analysis of the case of Tama high school in the 1970s). Waseda Daigaku Daigakuin Kyoikugaku Kenkyuuka Kiyo 22:1–15

Inui T (1990) Chiiki no atsukaikata – Yagaichousa jisshi no jittai to kongo no kadai (The way of handling a region: the reality of fieldwork implementation and its future tasks). Chirigaku Hyoron 63A:177–178

Inui T (2009) Yagai chosa no arikata to kadai (Methods and tasks of fieldwork). In: Nakamura K, Takahashi N, Taniuchi T, Inui T (eds) Chiri Kyoiku Koza, vol 2: Chiri Kyoiku no Houhou (Lecture of geography education, vol 2: method of geography education). Kokon shoin, Tokyo, pp 319–330

Matsumura S (2011). Shogakkou 3nensei "midika na chiiki"no gakushu no genjho to kadai –yokohama shiritsu shogakkou wo jirei to site (The current state and issues of the study of "a local area" in the third grade of elementary schools: the case study of Yokohama City), Nihon chiri kyoiku gakkai dai 61 kai taikai happhou youshi syu (Proceedings of the 61st general meeting of the geographic education society of Japan), p 26

MEXT (2008) Syogakkou gakushu shido youryo kaisetsu shakai hen (The instruction manual for national curriculum standards of elementary school: social studies). Toyo kan shuppan sha, Tokyo

MEXT (2010) Kouto gakkou gakushu shido youryo kaisetsu chiri rekishi hen (The instruction manual for national curriculum standards of junior high school: studies of geography and history). Kyoiku Shuppan, Tokyo

MEXT (Monbu kagaku sho) (2008b) Chugakkou gakushu shido youryo kaisetsu shakai hen (The instruction manual for national curriculum standards of junior high school: social studies). Nihon bunkyo shuppan, Tokyo

Miyamoto S (2009) Chugakkou syakaika chiri teki bunya no"midika na chiiki" ni kansuru kyoin no ishiki (The consciousness of teachers on the study of "local areas" in the geography education of junior high school). Shin Chiri (New Geogr) 57(3):1–13

Ohno M (1974) Firudo waku no shisou – Sabaku no nouminzo wo motomete (The philosophy of fieldwork: in search of the image of desert farmers). Tokyo Daigaku Shuppankai, Tokyo

Sakurai A (1999) Chiri kyoikugaku nyuumon (Introduction to geographic education). Kokon shoin, Tokyo

Shibusawa F (1985) Chugakkou shakaika ni okeru kougai gakushuu (A field trip on social studies in a junior high school). In: Asakura Ryutarou sensei taikan kinen kai (ed) Shakaika kyoiku to chiiki gakushu no kousou (The scheme of social studies education and community study). Meiji tosho shuppan, Tokyo, pp 229–238

Shibusawa F (1998) "Mijika na chiiki" wo ikashita nihon no shochiiki gakushu no jugyo kaizen (The improvement of classwork on the study of japan's regional geography using the study of the "local areas"). Shakaika Kyoiku Kenkyu 80:9–20

Shimura T (2009) "Komedokoro" Echigo heiya no henyo – Chuugakkou shakaika chiriteki bunya "mijika na chiiki no chousa" no jirei to shite (Transformation of the Echigo plain as a "rice-producing region": the case study of the "investigation of local areas") - Geography in Social Studies on a Junior High School). In: Tabe T, Tajiri S (eds) Daigakusei no tame no shakaika jyugyou jissen nouto (Notes for the practice of social studies classes for university students). Kazama shobo, Tokyo, pp 70–76

Shinohara S (2000) Chiri kyoiku ni okeru yagai chosa no jittai to sono saikouchiku heno teigen (The reality of fieldwork on geographic education and proposals for its restructuring). Shin Chiri (New Geogr) 47(3/4):131–141

Shinohara S (2001) Chiri yagai chosa no susume – Shou, chuu, kou, daigaku no jissen wo toshite (Encouragement for geographic fieldwork: through the practices in elementary, junior high, and high schools and a university). Kokon shoin, Tokyo

Takeuchi H (2002) Yagai chosa no arikata to kadai (Methods and tasks of fieldwork). In: Takeuchi H, Kagami M (eds) Mijika na chiiki no shirabekata (How to investigate a local area). Kokon shoin, Tokyo, pp 1–6

Takeuchi H (2010) Jyugyo zukuri ni ikiru jinbun, shakai kagaku no kiso gijyutsu – Chiiki chosa no shuho wo manabu (Basic techniques of human and social sciences for the use in a classroom: learning the method of field research). In: Tokyo Gakugei Daigaku Shakaika Kyoikugaku Kenkyuushitsu (ed) Shogakko shakaika kyoshi no senmonsei ikusei, kaitei ban (Professional training for elementary school teachers of social studies, revised). Kyoiku shuppan, Tokyo, pp 46–53

Teramoto K (2002) Chizu no gakuryoku (Academic achievement of geography). Meiji tosho shuppan, Tokyo

Toida K (2007) Firudo waku shidou no kadai (Tasks of fieldwork guidance). In: Kobayashi K (ed) Jissen chiri kyoiku no kadai – miryoku aru jugyo wo mezashite (Practical themes in geography education: toward an attractive teaching of geography). Nakanishiya shuppan, Kyoto, pp 222–236

Toriumi K (1990) Yagai kansatsuryoku, shashin dokkairyoku oyobi chikeizu no dokuzuryoku no hattatsu to ikusei (Development and training of skills of outdoor observation, capacity for understanding pictures, and ability to read topographic maps). Shin Chiri (New Geogr) 37(4):40–47

Ukita T (1970) Chirigaku ni okeru chiiki no sukeeru – Toku ni nogyo chirigaku ni okeru (The scale of regions on geography: especially on agricultural geography). Jinbun Chiri (Jpn J Hum Geogr) 22(4):33–47