

Symposium II: Acquirable qualifications at Departments of Geography

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Symposium II: Acquirable Qualifications at Departments of Geography

The Aim of This Symposium

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At present, many departments of geography have been trying to acquire qualifications asso-

ciated with geography and engineering. This symposium aims to report and exchange views in regard to these qualifications. Especially, the following four qualifications, GIS professional certification, Social Researcher, Japan Accreditation Board for Engineer Education (JABEE), and Hokkaido Outdoor-guide qualification were reported.

GIS professional certification program has been planned by GIS professional certification program committee of AJG and GIS Association in Japan. USUI and SUZUKI reported about

this certification. JABEE (Japan Accreditation Board for Engineer Education) is a professional accreditation organization and which accredits the qualification of trainee professional engineer to those who graduated from accredited higher education facilities. FUKUSAWA, NAKAYAMA and WAKABAYASHI reported about this certification. Social Researcher was established by JCBSR (Japan Certification Board for Social Researcher). AOKI and MIZUNO reported about this certification. Hokkaido Outdoor-guide qualification was established by Hokkaido provincial government. ONO reported about this qualification.

These "new" certifications are not only acquired just by graduating from higher education facilities. But also these higher education facilities must be examined and have their curriculum certified by accreditation organizations. To be certified as an accredited facility, higher education facilities must satisfy the following four common requirements. (1) Curriculum must be clearly defined and assured, (2) curriculum must be constantly reviewed, (3) curriculum must adopt social demands, and (4) student's achievements must be correctly evaluated. These requirements should be originally suggested by these higher education facilities themselves. However, necessity of external accreditation shows the misfit between the curriculum of higher education facilities and social demands. Therefore, the facilities have been trying to acquire these certifications. Acquiring accreditation requires significant reorganization to faculty curriculum, and will present the construction of a new model of departments of geography. These certifications would not be acquired only efforts of teaching staff, but also collaboration among staff, students and social efforts should be necessary.

GIS Professional Certification

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The aim of establishing GIS professional certification in Japan is to develop knowledge-intensive information industrials (especially "GIS industrials") through training GIS professionals. Many qualification systems to accredit individual engineering skills and CPD (continu-

ing professional development) have been developed by collaboration of academic societies and higher-education facilities overseas. Therefore, not only establishing GIS courses in universities but also GIS certificate programs by GIS-related societies has been broadened.

In United States, Department of Labor added two new occupations, "GIS Specialist" and "GIS Professional", to occupation classification list in 1993. So, many GIS professional training courses were established in US universities. Approximately 700 of GIS professional training courses are already set up in US and 500 courses are set up in European countries. In United States, a new discipline "Geographical Information Science" was proposed in the early 1990's. And University Consortium for Geographic Information and Analysis (UCGIA), which is university collaboration of 11 disciplines, was established. About GIS professional certification in US, GIS professional certification curriculum of higher education facilities and governmental and non-governmental organizations have carried out skill-training GIS intern system. In US, GIS related academic societies (e.g. URISA and ASPRS) produced GIS professional certification program. And in UK, the Association of Geographic Information (AGI) also established CPD programs for GIS professional training.

Urban and Regional Information Systems Association (URISA) established a GIS professional certification committee, and started to develop a certification program. The characteristic of URISA's certification program is a point-based system that is self-documented and calculated by the individual seeking certification. This system does not include any qualification examination. Individual applicants must get a total of 150 points from three sections (educational achievement, specialty experiment, and professional skills for social contribution). GIS professional certification is taken by acquiring these points within five years and continuing every five years. Educational achievements can be given by not only taking university curricula but also taking GIS training course and workshops carried out by university and other organizations. Therefore, URISA's certification program is regarded as not an examination-

based system but CPD-based system. Specialty experiments are calculated by summing up occupation years for GIS related operation. To certify specialty experiments, applicants must present portfolio-style documentary evidence. Contents of portfolio will be examined by accreditation organization. GIS Association of Japan is now investigating whether URISA's GIS professional certification systems are suited to Japanese actual conditions.

In 2002, GISAJ and CSIS in the University of Tokyo established cooperative exploratory committee for GIS professional certification. To accomplish GIS professional certification program, GISAJ have proposed collaboration with other GIS related academic societies, and just started to develop this certification program.

GIS Certification Program and Model Curricula Development for Geography Major Students

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Rissho University

In 2003, executive board of AJG decided to investigate "Ground Vision of AJG". The vision includes the construction of qualification system which contributes to improvements of geography's position in society. The qualification system consists of professional education, business training, accreditation examination and CPD (continuing professional development). Higher education facilities are responsible for carrying out professional education under common curriculum. Business training requires that applicants should occupy suited operation for a fixed period. Applicants who want to be accredited to qualification must develop their skills and knowledge by carrying out continuing professional development, and they must improve professional ethics. These qualification systems are based on international common agreements. However, to introduce these systems in Japan, further discussions about educational program development and generalization, ensuring training organization, and CPD system and CPD weight factor (CPDWF) definition should be required. GIS certification program committee of AJG, established in September 2003, is responsible to figure out these issues.

National Center for Geographic Information and Analysis (NCGIA), which aims to develop and educate GIS, was established in 1988. NCGIA published "Core curriculum in GIS" in 1990. This is a basic document for GIS trainers and consists of 5 chapters and 27 sections. This document plays a major role in indicating early GIS course, but has not been accomplished yet. University Consortium for Geographic Information Science (UCGIS) was established in 1994. Its roles are to make satisfactory undergraduate programs concerning geographic information sciences and technology. To improve consistency of accreditation program, UCGIS curriculum should promote interaction among concerned academic fields. This GIS program has been exploited not only by students in education but also other involved persons. The program consists of 12 knowledge sections, subdivided into some units and topics. Students can select one or more sections, units and topics on requests.

In Japan, GIS Association of Japan (GISAJ) edited the program "The development of GIS core curriculum" in 2004. GISAJ also proposed the following nine contents based on 14 English documents published by NCGIA and UCGIS: (1) Introduction, (2) A basic concept and modeling of real world, (3) Spatial modeling, (4) Acquiring spatial data, (5) Editing spatial data, (6) Analyzing spatial data, (7) Visualizing spatial data, (8) Development of GIS system, and (9) GIS and society. Each topic has two levels according to its importance. GISAJ is planning to continuously improve the contents by using public feedback. The above mentioned curriculum has been proposed independently from particular faculties. Therefore, organizations can modify this curriculum on requests.

The Association of Japanese Geographers organized a symposium concerning to GIS educational programs and practical reports in 2002. However, AJG has not debated the contents of GIS education program and its generalization. In US, major geographic departments had actively argued and reported on their practice at cartography and GIS related journals. These arguments were affected by restructuring paper base cartography into GIS base curriculum between late 1980's and early 1990's. To intro-

duce a GIS professional certification in Japan, we must argue that which subject should be adopted into GIS curriculum.

Introducing Progress of the "Social Researcher," in the Case of the Department of Geography, Faculty of Letters, Kanazawa University

AOKI Tatsuto

Kanazawa University

Social researcher is a professional qualification accredited by Japanese Certification Board for Social Researcher (JCBSR). JCBSR was established by four social science related academic societies, and begun to accredit social researcher from 2004. To accredit a social researcher, JCBSR requires that applicants must be equivalent to graduating from university or other higher education facilities. And they must have sufficient skills, knowledge and ethics about social research.

Accreditation process of social researcher is as follows; (1) higher education facilities, which wants to accredit their students as social researcher, present their curriculum list that is compliant with "standard curriculum" to JCBSR every year. JCBSR examines and accredits the list. (2) Students who want to acquire the accreditation of social researcher should take their classes from the list to satisfy the standard curriculum, and present their credits to JCBSR. (3) JCBSR examines the credit and accredits the applicant as social researcher. The standard curriculum is divided into following six categories; (A) classes for basic social research understandings, (B) class for research plan and operation, (C) class for basic analysis of data and documents, (D) class for statistics concerning to social research, (E) class for quantitative data analysis, (F) class for qualitative data analysis, and (G) class for social research practice. Facilities select one or more categories from above mentioned six categories. And they make their own original curriculum to comply with the standard curriculum. In 2004, accredited geography departments are only Kanazawa University and Kyushu University.

Department of geography at Kanazawa University begun to discuss about application for

social researcher in October 2003. Department of social sciences suggested social researcher qualification to department of literature, law, economics, education, and so on. However, only department of geography and department of ethnology accepted this suggestion. These three departments, geography, social sciences and ethnology, are belonging to different departments. But we have common minor courses, so we were able to smoothly deal with introducing social researcher. After explanation from department of social sciences, we interviewed students about demands on social researcher. Students who carry out interview and questionnaire research in their work have intent to acquire the qualification of social researcher. They also consider that increase of their qualification is an advantage in job hunting, and they can apply to social researcher with just an increase of four more units. So, the department of geography begun to work out how to introduce social researcher.

In 2004, we applied social researcher with "practice of human geography" class to category B and D, "practice of geographic research" class to category C and F, and "graduation thesis" class to category G. In consequence, we could not be accredited as social researcher. Because JCBSR pointed out that syllabus of classes which applied to categories C to F do not correspond to the standard curriculum, and class applied to category G (graduation thesis) is not appropriate for training knowledge and skills about social research. In 2005, to solve this problem, we eliminated graduate thesis from category G, and introduced intensive lectures for categories C, F and G to doubt the learning time.

To acquire the qualification of social researcher, geography major students must take "general statements of social sciences" class which corresponds to category A. in 2004, 16 of 20 students in department of geography took this class. This indicates that students have a deep interest to become social researchers. But geography major students have less knowledge and experience concerning statistics than other students. Only two thirds of students could acquire the unit of "general statements of social sciences". On the other hand, taking social sci-

ences related classes causes students to apply the techniques of social sciences to their reports and graduation thesis.

We cannot conclude that acquiring social researcher qualification is useful in job seeking and student recruiting, because of social researcher is only recently established as a certification. However, students want to acquiring qualifications, and acquiring qualification becomes an advantage in job seeking. Therefore, we should provide corresponding curriculum to accredit qualification. So, we will be able to appeal that our curriculum is useful for job seeking.

Geography Curriculum and Social Researcher in Ochanomizu University

MIZUNO Isao

Ochanomizu University

Ochanomizu University has been reconfiguring their curriculum to acquire social researcher qualification. And now, we are applying social researcher. We report about our experience concerning social researcher to guide other universities.

Faculty of letters and education at Ochanomizu University was regrouped in 1997. Department of geography became "geography course" in the faculty of human and social sciences. This reorganization is not only change of name. Firstly, entrance examination is carried out with other departments (philosophy, history, and geography), and course selection is carried out in the second year. So, students do not go up to geography course without any appeals and advantages. Secondly, qualification of trainee surveyor, which certified to former department of geography, was cancelled. We have to discuss a strategy about the availability of acquiring new qualifications.

In Ochanomizu University, social researcher status was considered to be of no concern to the geography course. Courses of social sciences, education, and psychology had been planning to apply social researcher based on their curriculum. This demonstrates the actual faculty compositions of Ochanomizu University. However, it also shows that these courses have less understanding of the geography course. Geography course required to attend above men-

tioned social researcher qualification, and proposed our curriculum to register the standard curriculum of social researcher qualification. At first, other courses were skeptical about the commitment of geography course. However, because geographic course offered six classes to the standard curriculum, we can play an important role among these courses. So, social researcher of Ochanomizu University can acquire two more categories.

The advantages of acquiring social researcher in geography course are concluded as follows; (1) Students of geography course can acquire social researcher with taking core curriculum of geography course and two more class of other course, (2) students can learn methodology and techniques of social sciences (especially statistics and quantitative analysis), so they can cover weakness of geography course's curriculum, and (3) students of geography course can insist on their identity to other courses by offering field works (qualitative analysis).

Consideration of new strategies in geographic community and university will be raised through applying for social researcher qualification. To discuss these issues with related academic societies, we geographers should accept many techniques and methodology of social sciences, especially inductive statistics, questionnaire design, random sampling, data cleaning, SPSS, and interpretation of results. This acceptance will lead us to have a new understanding of quantitative geography. And we will have to adopt these techniques to our curriculum. This is an important task as well as GIS.

Concepts of JABEE and Its Accreditation Processes

FUKUSAWA Hitoshi

Tokyo Metropolitan University

The aims of Japan Accreditation Board for Engineer Education (JABEE) are to improve engineering education and to establish international equivalent through accreditation of education programs. Main target of accreditation is education program itself, and higher education facilities have responsibility for operation.

The background of external accreditation ne-

nessity can be considered to be that the curriculum of higher education facilities in Japan is calling into question. The reason is summarized as three causes. The first is due to student's side, diversification of students and decreasing of motivation for learning, self learning deficiency, lacking of application and understanding availabilities, degradation of design skills. The second is due to facility's problem, less understanding and recognition about guaranteeing student's qualities, and lack of engineer education and disproportionate emphasis on basic engineer and theoretical education. Third, due to social side recognition that engineers are not professional but they should belong to some kind of incorporation.

JABEE's accreditation consists of six criteria and supplementary sectoral requirements; (1) definition and disclosure of learning and education subjects, (2) learning and education quantity, (3) medium of education, (4) education environment, (5) achievement evaluation of learning and education subjects, (6) improvement of education, and supplementary sectoral requirements.

JABEE accredits higher education facilities based on their application. Basic and common ethos of JABEE includes that facilities must encourage student's self development and learning, acquiring availabilities and ethics required for a professional engineer. Therefore, higher education facilities must clearly define their learning and education subjects, and make sure these are understood by students. Not only sufficient teaching staff, learning programs, and education environments are required, but also that FD and networks among teaching staff are functioning, teaching staff's educational contribution is evaluated. And faculty and student's achievements are properly evaluated according to published syllabus, and that only students who satisfy defined learning and education subjects can graduate from the program. These requirements have never been seen in Japanese education facilities. But its necessity should be recognized regardless of JABEE.

JABEE's accreditation will cause a paradigm shift in Japanese engineering education. A part of the paradigm shift is the first significance of

JABEE's accreditation for engineer education. This significance is represented as follows; (1) Teaching to learning, (2) individual learning to group or cooperative learning, (3) obscure social contract to distinct agreement of learning achievement, (4) disregard of education evaluation to self-understanding. Method and evaluation education are not individual and teaching staff is responsible for evaluation, and (5) disproportionate emphasis on knowledge-base education to problem-solving approach of real society. The second one is based on revised professional engineer law. According to this revision, students who graduated from accredited higher education faculties hold the equivalent to satisfying fundamental professional engineer education. And they regard as trainee professional engineers and absent from the first examination of professional engineer. Therefore, this assures the linkage between engineering education in faculties and qualification of professional engineer.

The aims of accreditation are following; (1) guaranteeing engineer education quality, (2) continuing development of engineer education program by introducing new education system, (3) construction and development of engineering education evaluation system, (4) clarifying faculties, responsibilities and role of educational staff, and making evaluation system which evaluates staff's educational contribution.

The accreditation covers undergraduate programs and other higher education faculties with following conditions; (1) education programs must carry out fundamental engineer education and whether a faculty or a department. (2) program must include not only special subjects but also all curriculum, processes and environment of education, (3) the program should not be limited to one program for one department. (4) Program can consist of multiple departments. The validity period of accreditation is basically limited to five years. Students who graduate within five years just after accreditation are accredited as trainee professional engineers.

Participation in JABEE at the College of Humanities and Sciences, Nihon University

NAKAYAMA Yasunori
Nihon University

At the department of geosystem sciences, Nihon University, was accredited by JABEE in May 2004. The first 67 students who completed the accredited program and were accredited as trainee professional engineer graduated at the same year. In this report, we explain how our education program was accredited by JABEE. And also we report about our faculty organization, characteristics of education program, effects of accreditation, and further tasks.

In the department of geosystem sciences, we had begun to prepare for JABEE in 2001. We applied for JABEE accreditation through reviewing our education program and developing faculty. In 2004, our program "department of geosystem science" was accredited on "earth science and resources division" in JABEE.

We established a professional engineer education committee in our department to accredit to JABEE. The committee consists of 10 sub-commissions about learning and education subject, achievement evaluation, education development, adviser system, and others.

Accredited program "department of geosystem science" mainly consists of lecture course and practical course. Both courses step up from introduction to special subject and application subject. In the first year, students take fundamental earth science and other related subjects as introduction program. In the second year, students take special program to train and acquire special skills and knowledge. In the third year, students take application program of scientific research, advanced special lecture, and ethics of professional engineer. In the fourth year, students take practical training through their research work, and they can acquire flexible knowledge and skills to solve many social problems. The characteristics of our program are as follows; (1) practical training education through field work and laboratory experiment has importance rather than acquiring knowledge and skills, and (2) first-year students can take field work practice, because they can get further understanding and knowledge about natural phenomena acquired through funda-

mental lectures and laboratory experiments.

Educational staff and students have feeling of tension after accreditation. Because evaluation and exploitation, defined by learning and education subject, has been exactly carried out. We can point out that this tension is caused by JABEE's accreditation. And also, we have many professional engineers who graduated from our department, and they expect JABEE's accreditation. On the other hand, self-understanding of teaching staff and students increase because of requirements for quality guarantee and improvements caused by accreditation. And contributions to both research and education, continuous improvement for education staff are required. Therefore, responsibility of staffs also increases. We must enforce teaching and other staffs to deal with these issues.

Accredited program "department of geosystem science" is not mature yet, and further improvements of our faculty, contents, and subjects are necessary. Therefore, students and social demand accomplished by collaboration with external advisory and alumni association should be taken into account. Especially, graduator's social activity as professional engineer and feedback on the program are significant. In addition, publication of JABEE program and its effect will be required.

Educational Reform Based on JABEE in Department of Geography at Tokyo Metropolitan University

WAKABAYASHI Yoshiki
Tokyo Metropolitan University

Department of geography at Tokyo Metropolitan University had been accredited by Japan Board for Engineering Education (JABEE) in 2004, as the first education program in geography related departments. Here, we report about how our department was accredited as an engineering education program.

In 2002, we had started to consider JABEE. At that time, JABEE had just established and been less known not only among geographic society but also sciences. Therefore, we began to arrange documents for trial examination in cut and try. Our aim of applying JABEE accreditation was to appeal the identity of our

department in progressing faculty reconstruction. And we decided that qualification of trainee professional engineer can be an advantage for student's job hunting. And also, curriculum of our department was suitable for JABEE application, because the curriculum consists not only of science and technological class but also arts and social class. This integrated curriculum is significantly required to acquire JABEE accreditation.

Trial examination was carried out in 2002. However, JABEE pointed out some deficiencies to our application. So we had to prepare to improve these deficiencies. Especially, preservation of examination papers and reports, and record of faculty development are required. So, education staff's workloads increased. However, because our departments has sufficient flexibility and scale to prepare to change, we could go in for examination.

As practical preparation for faculty development, we carried out not only satisfying syllabus and evaluation by students, but also work out peer review by educational staffs and public offering of graduate and master's thesis theme. These plans were carried out as parts of faculty development, and we got a certain amount of effectiveness to improving staff's rethinking and teaching skills. And also these plans became a good opportunity to consider engineering ethics and design ability, which had been regarded as having no relation with geography.

In April 2005, our university restarts as a new university which reorganized four municipal universities and colleges. Department of geography is belonging to the Department of Urban Environment, and its name changes to Geographic Environmental Course. According to nation wide reorganization of universities, we are required not only carrying out research work but also education based on a practical branch of learning. These requirements suits JABEE's concept. Especially, in development of design ability, which solves social demand, availability of geography in application aspect will be tested. However, we cannot be optimistic even if we were accredited by JABEE. Because we must pass intermediate examination to keep our accreditation, our budget to prepar-

ing documents and examination costs are not small. And to deal with changes of social and student's demands, continuous faculty development will be required. So, we cannot keep our program without collaboration with teaching staff and student understands. We cannot conclude how these activities will be evaluated in future. However, for our department, activity to JABEE becomes a good opportunity to reconsider ourselves.

Linkage to the Hokkaido Outdoor-guide Qualification System of the Graduate School of Environmental (EARTH) Science, Hokkaido University

ONO Yugo

Hokkaido University

Hokkaido provincial government established the Hokkaido outdoor-guide qualification in 2002. This qualification has started accreditation in following six special categories; nature, summer mountaineering, winter mountaineering, canoeing, rafting and trail riding. To acquire the qualification, applicants must pass examination of common fundamental subject and special categories. And also they must pass a practical examination of special categories. The ratio of successful applicants reaches approximately 30 percent. Hokkaido provincial government also introduced another system, which accredits a higher education facility as a personal training organization of Hokkaido Outdoor-guide qualification. Accredited organizations are some nonprofit organizations, professional schools, private universities, and the graduate school of Environmental Science on Hokkaido University as a national university. Hokkaido University of Education also accredited as the second national university in 2005. When organizations were accredited, their students can absent from paper test. However, they must take a practical examination, and are required some practical works. To increase successful applicants, Hokkaido provincial government made text books for examination, and they intended to improve the level of guides. At the present, this qualification has been admired by cooperation of the Hokkaido Outdoor Association and Hokkaido provincial government. In the future, the Hokkaido Out-

door Association will responsible for all activities.

Geoecology course of geoscience at graduate school of earth science consists of physical and environmental geography. However, we have been seriously affected by decrease in applicants for admission and their qualities. The most significant reason of this decrease is regarded as increase of graduate school applicants from the same faculty. And increase of environment-related new graduate schools decreases the existence value of original environment-related graduate schools. Decrease of student's quality causes serious problems on a nationwide scale. However, we cannot ignore that

decrease of researcher-intending student and increase of those who intends to obtain nature-related practical occupations such as nature-guide or ranger. The opportunity for obtaining jobs, which students can apply their knowledge and skills in graduate school, has been getting reduced. Therefore, many students are against research base education system. So, we established "the course of nature guide and environmental preservation manager" in our course and trained students. On April 2005, we establish a new division of environmental science development, and start a practical training in this division.