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Lost in Translation: Cross-Cultural Experiences in Teaching Geo-Genealogy

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ABSTRACT *This paper reports on a cross-cultural outreach activity of the current UK 'Spatial Literacy in Teaching' (SPLINT) Centre of Excellence in Teaching and Learning (CETL), a past UK Economic and Social Research Council (ESRC) grant, and shared interests in family names between Japanese and UK academics. It describes a pedagogic programme developed for Japanese postgraduates and advanced undergraduates that entailed quantitative and qualitative analysis of the spatial distributions of Japanese family names. The authors describe some specific semantic, procedural and theoretical issues and, more generally, suggest how names analysis provides a common framework for engaging student interest in GIS.*

KEY WORDS: GIS, geodemographics, family names, Japan

Introduction

The 'Spatial Literacy in Teaching' (SPLINT) Programme is a Higher Education Funding Council for England (HEFCE) funded Centre for Excellence in Teaching and Learning (CETL), run jointly between the University of Leicester, Nottingham University and University College London (UCL). The remit of SPLINT is to extend pedagogic best practice for the teaching of postgraduate-level spatial concepts, principally but by no means exclusively at the Master's level. In terms of the mission of the multi-site CETL, 'spatial literacy' is defined as the formal ability to think spatially and to adopt an explicitly spatial metaphor when approaching problems or analysing relationships. As such, spatial thinking extends from concepts of low-level spatial cognition through to those of high-level spatial reasoning (Goodchild, 2004), and includes the process of solving spatial problems (e.g. Baker & Bednarz, 2003).

There is considerable international interest in the development of the spatial literacy agenda, at levels ranging from the high school, through undergraduate and postgraduate taught courses to research. For example, Goodchild and Janelle (2004) discuss how explicit consideration of space and location is often core to problem-solving right across social science, and how space acts as an integrative organizing framework, while Tate *et al.*

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(2005) examine its broader role in university teaching practice. This avowedly inter-disciplinary stance is also central to an important National Academies (2004) report that sets out the case for incorporation of spatial literacy issues in US K–12 instruction, while the US University Consortium for Geographic Information Science has suggested priorities for research (UCGIS, 1996) and education (http://www.ucgis.org/priorities/education/educationpriorities.htm).

There are parallel aspects to these developments in the Japanese context, notably in coordination of the development of a university core curriculum. In this context, it is important to note that there are as yet no specialist postgraduate (or undergraduate) GIS programmes in Japan, although there are GIS streams in disciplines such as geography, architecture and engineering. These courses tend to have a stronger focus upon socioeconomic applications than their UK and US counterparts, and there is a recognized need amongst university educators for generic issues of application that will crystallize interest in the developing GIS sub-discipline. The need to broaden Japanese GIS education from what is often seen as a preoccupation with technology towards broad-based socioeconomic applications is manifest in the Japanese language textbook written by one of the authors of this paper (Yano, 1999). In the UK context, much of the resourcing of the SPLINT CETL has been focused upon the creation of 'well found' teaching facilities using sophisticated geographic data-handling technologies. However, the UCL site in particular also has a remit for the development of outreach initiatives that extend both the scope and practice of spatial learning into other university curriculum areas, and indeed beyond the realm of academe. Many of the activities of the UCL SPLINT team are documented on the website (http://www.spatial-literacy.org).

The outreach remit of the SPLINT CETL includes general awareness-raising of spatial literacy issues. To date, the most popular application that has appeared on the SPLINT website is the 'surname profiler' which allows users to create surname distribution maps and associated statistics for 1881 and 1998. This resource is a product of a UK Economic and Social Research Council (ESRC) grant and collaboration with ESRC Data Archive Director Kevin Schürer. The project undertook a quantitative analysis of almost all family names present in Great Britain in 1881 and 1998 and created a resource that would permit social scientists to analyse the degree of concentration of different types and aggregations of family names, for example as an indicator of migration and residential mobility histories and of social mobility (Longley *et al.*, 2007a).

At the end of the project, it was decided to create a free-to-access website that would allow web access to parts of this quantitative resource, and hence to pursue the wider remit of the SPLINT CETL by allowing individuals to understand changes in the spatial distribution of their family names over the period 1881–1998. Following an ESRC press release, the site became a quite astonishing overnight outreach success: over the course of 2006 the website attracted 1.4 million unique users from 147 countries around the world. The interest in the website was propagated by a series of engaging and topical press features in a wide range of national, regional and local media: during 2006 there were over 100 press articles, television and radio appearances which resulted in sustained interest in the website (see http://www.spatial-literacy.org/?page_id=90 for a current list of features to date). On a peak news day after features on Channel 4 News and the BBC Online website the site attracted over 200 000 unique users in a single afternoon. Such was the popularity of the site that Google trends analysis of searches on the terms 'spatial' and 'literacy' reveal two significant peaks at the time of peak media coverage. This provides

evidence that the SPLINT CETL activities have, as a minimum, increased awareness of the term 'spatial literacy', while the volume of general usage of the website suggests that it provides a platform for greater public engagement with the organizing concepts of spatial literacy. The surnames area of the website provides details of the areal units used to produce the maps, and also describes the creation of a number of indices of spatial concentration. The web mapping raised many general issues of spatial representation and cartographic design, and the 500+ email enquiries about the site identified wide-ranging challenges in implementing the spatial literacy agenda amongst the general public. For example: the process of matching 1881 parish data to 1998 postal geography entailed assumptions and an output geography that many amateur genealogists found perplexing; many users found the choropleth map shading (revised to improve clarity during the lifespan of the website) confusing; and some users experienced additional difficulty in interpreting the increasing geographic spread of most all names over the 1881–1998 period.

There are a number of other reasons why spatial analysis of the distribution of family names is material to the outreach role of the SPLINT CETL. Most Anglo-Saxon family names exhibit spatial concentration, yet in common with most geographic phenomena there are no obvious natural units through which to analyse their concentration. Similarly there are no clear guidelines as to how to examine the spatial diffusion of family names over time, or obvious guidelines as to how different names might be aggregated in region-building experiments (see Longley *et al.*, 2005, pp. 8–11). There are also issues of data quality too, arising not only from likely errors in transcription of 1881 Census records, but also from omissions from the 1998 Electoral Roll, which was used as the base for the second-time slice calculations. The development of the website heightened the awareness of the UCL team of the potential usefulness of family names to develop and illustrate geographic issues of spatial and social mobility, of labour-market functioning, and latterly of international migration patterns (see Longley *et al.*, 2007a).

Our emergent view is that geographic analysis of family names is an important and very under-researched area of enquiry (but see Schürer, 2004). The broadening of the team's own horizons to consider the usefulness of family names to understand international migration provided one of the motivations for developing short course material on family mapping in a different national context. Following a sabbatical in London, one of us (Yano) began to introduce the idea of 'surname maps' in his teaching at Ritsumeikan University, and found that it generated considerable interest. There is some anecdotal evidence of previous interest in the geography of surnames (Professor Sadahiro has referred to this in his teaching at Tokyo University) but, as in the UK, latent interest in this area has only to date been developed by amateur genealogists.

Short Course Development and its International Content

The organization of the global outreach exercise documented in this paper was propagated through a relationship between the Centre for Advanced Spatial Analysis (CASA) at UCL and the Department of Geography at Ritsumeikan University in Japan. Following Professor Keiji Yano's successful six-month sabbatical at CASA in 2005–2006, a number of reciprocal visits to Japan were made by UCL academics, in order to run a series of courses and seminars. Keiji Yano's initial sabbatical visit culminated in the preparation of a report that highlighted a number of changes in the organization, content and delivery

of tuition in GIS, specifically with regard to graduate programmes. These findings included a relative emphasis in Japan upon business and marketing applications in human geography, relative to the environmental and physical geography applications that are commonplace in the UK and US. It was also apparent that the development of postgraduate education in GIS was at a more formative stage in Japan, and that cross-disciplinary applications of the kind developed in the SPLINT CETL might help to garner interest not only in the application of geographic information technologies, but also in the principles governing effective spatial analysis applications. The purpose of the visit described in this paper was to crystallize some of these commonalties and differences, and to investigate the applicability of an extended piece of UK project work to the Japanese setting. Accordingly, a visit from UCL to Ritsumeikan University took place in May 2007 and involved Professor Paul Longley and Dr Alex Singleton presenting an intensive week-long course on geographical information systems (GIS) and geodemographics. The central motivation for the course was to describe to advanced undergraduate and postgraduate Japanese students some of the different ways in which value may be added to spatial data, and to give them 'hands on' experience of doing this through structured practical computer exercises and a short research project.

A series of lectures was based loosely around the early chapters of Longley *et al.* (2005), while hands-on experience of the basic concepts was delivered using free-to-access online 'Virtual Campus' materials provided by the same authors (Longley *et al.*, 2007b; see also Johnson & Boyd, 2005). The culmination of the course was a group project and presentation that adapted the approach of the Great Britain family names website to the analysis of Japanese family names. The approach to this was to begin by thinking of individual family names as raw geographic 'facts'. The Virtual Campus exercises were used to introduce examples in which GIS was used to add value to such data in a geographic *information* system, through selectivity and preparation for purpose. Longley *et al.* (2005) provide GIS examples of how information is used to build evidence (e.g. through analysing multiple datasets or generating multiple scenarios), and thence assimilate knowledge (e.g. by reconciling computer-generated information with personal understandings of places and spaces), and advance wisdom (e.g. through policies developed and accepted by stakeholders).

Through a critical engagement between empirical analysis and prior understanding about places, the lectures and associated practicals sought to provide a platform of linked teaching resources. The approach was consistent with the mixed methods in GIS training advocated by Deadman *et al.* (2000) and their recognition that "the method of teaching used in the delivery of GIS courses has had to adjust to the needs of the subject matter" (p. 366). GIS remains a diverse sub-discipline with a vast range of applications in social, physical and environmental science (see Longley *et al.*, 2005, Chapter 2), leading to an acute requirement to tailor learning resources to meet the substantive needs and interests of students. GIS software has evolved to service these diverse needs, and user interfaces continue to become more easily navigable and open. However, central to successful application of GIS usage are the core organizing concepts of geographic information science, and the role of effective GIS is not only to provide a toolkit for tackling the unique, complex and sometimes difficult issues that are posed by the 'where' question, but also to ensure that the user is empowered to assess whether the results are safe to use. With this in mind, the online practicals on 'Turning Data into Information' presented summaries of the lecture (and textbook) materials and a series of practical exercises which

encouraged students to engage with the course learning objectives. The course reviewed many of the concepts considered in the lectures, drawing examples from social, environmental and physical science in order to sustain student interest. An important feature with regard to English-language instruction to a mixed (but generally very high) ability group of Japanese students was that the online practical exercises were very largely self-paced, with interim assessment for each laboratory class through a multiple-choice assessment (with a pass requirement of 80 per cent). Students attaining this required standard were then able to print out a certificate of successful completion.

The wider issues raised align with the debate concerning the relative benefit of traditional classroom and textbook learning against web-based methods (see Clark *et al.*, 2007). Viewed in this context, our use of self-paced practical classes proved to be very appropriate to the needs of our mixed-ability group of non-native English speakers. The textbook on which the lectures were based (Longley *et al.*, 2005) has sought to be innovative in aligning GIS education with an important wider trend in Internet-based learning: specifically that GIS education should not only focus upon instruction in the core organizing principles and techniques that underpin spatial analysis, but that it is also about adopting a critical stance when using search engines to establish the provenance of data, technique and software. In addition to the 'basic operations of GIS', the approach of the Virtual Campus exercises was to encourage students to search out both quantitative and qualitative sources of geographic information for use within and alongside GIS. It also introduced the students to http://www.spatialanalysisonline.com, an online resource produced through the SPLINT CETL to encourage critical use of spatial analysis techniques in GIS (see De Smith *et al.*, 2008 for a printed version of the online resource).

Family names were chosen as the focus of the project work because previous experience in the SPLINT CETL had demonstrated their appeal in the UK. We anticipated that the analysis of names provided a focus that would engage students from a wide range of disciplines and with substantive interests across the full range of GIS applications. There is general awareness amongst postgraduate Japanese students of historic population movements, such as movements from outlying islands (such as Okinawa) to metropolitan areas, and the implications of government policy, such as the settlement of Hokkaido. Names research provided an important and interdisciplinary project that also encouraged the students to develop mixed-methods research by searching for qualitative sources.

The intensive course at Ritsumeikan University began with a special public lecture that set out the broad research remit of geodemographics (the study of people according to the neighbourhoods in which they live: Harris *et al.*, 2005) and the way in which study of neighbourhoods raises issues that are core to the remit of geographic information science (GISc). The lecture concluded with discussion of some of the speculations arising from the Anglo-Saxon surnames project (what is the natural unit of analysis of family name concentrations? How might the geographic diffusion of family names be measured? How might individual family names be combined to present pictures of regional difference and change?) in order to seed interest in the topic in the project that the students would undertake later in the week. The progression of the course from the keynote, through the lectures and practicals, to the geographic analysis of Japanese family names presented a path of problematization in which core organizing principles were applied to an increasingly specific problem of interest to all of the students (who each, after all, had a family name!). This is shown in Figure 1. The relevant core organizing concepts were introduced in generalized form through lectures; reinforcing practical sessions gave

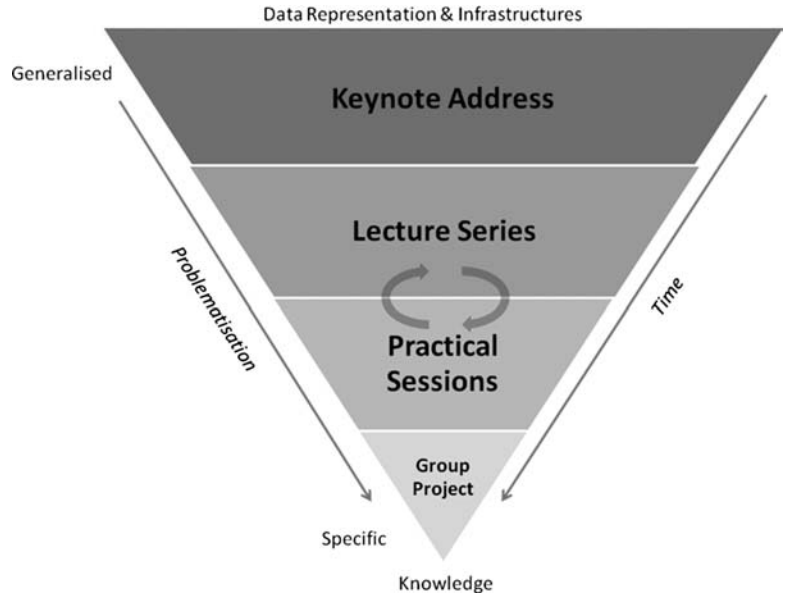


Figure 1. The path of problematization in the course

students the training skills necessary to analyse the name problem (using ESRI's ARCGIS 9.2); and small groups of (typically 2) students were able to apply the learned framework to analyse a specific problem of spatial data analysis.

The course was run intensively over a working week and was structured as follows:

- One keynote seminar—'GIS and Geodemographic Data Infrastructures', delivered in English with a closing summary translated into Japanese.
- Five course lectures, delivered with serial translation:
  - Geodemographics and GIS;
  - Digital representations and GIS;
  - A gallery of geodemographic applications and their scientific underpinnings;
  - The nature of geographic data;
  - Uncertainty in the representation of geographic phenomena.
- Four associated practical classes, written in English, implemented using the Japanese version of ArcGIS 9.2
  - Basics of data and information using ArcGIS 9;
  - Observation, visualization and user interaction;
  - Query and measurement;
  - Transformations and descriptive summaries.
- Group project on the analysis of Japanese family names, introduced in English with serial Japanese translation.

The structure of the five lectures delivered as the core of the learning programme can be reconstructed from the skeleton PowerPoint files that are freely available online and link

to the 'Geographic Information Systems and Science' textbook.[1] Additional material was used to adapt these presentations to this specific course by introducing content on many of the geodemographic applications that have been developed in recent years by researchers at UCL's Centre for Advanced Spatial Analysis, and also adding some local content relevant to Japan. Attempts were made at various points to introduce issues pertinent to geographic description of family name distributions, together with issues associated with the conception, measurement, representation, visualization and analysis of family names, although much focus was inevitably placed on the GB family name profiler application and the types of information that it can provide. The course tutors knew rather little about Japanese family names when they boarded the outward-bound plane to deliver the course, but the students willingly assisted them along a steep learning curve! Taken together, these activities made it possible to contextualize the research case studies discussed in the opening public lecture, both within an analytical framework and in the context of the geography of Japanese family names. The self-paced practical exercises supplemented the lectures by providing summaries of the lecture content and reinforcing the learning objectives through practical exercises using ArcGIS 9.2. The practical sessions, which are also available for use free of charge to other instructors (under standard ESRI GIS site licence arrangements) are designed in order that a novice or inexperienced user can become proficient in the techniques of basic GI analysis by the end of the course, while also gaining familiarity with the core organizing concepts of GIS as espoused in the lectures. In our case the motivation for so doing was to ensure that each member of our mixed-ability group was sufficiently well equipped to complete the group-based project.

The Group Project: An Analysis of Japanese Family Names

The core task of the Group Project was to analyse data on family name distributions in Japan, and the students were assigned into pairs for the task. Japanese family names are called Myōji, Uji and Sei, and originated from names granted only by the emperor, nobles and samurais between the end of Heian-era (twelfth century) and the Edo era (1603–1868). Following the Meiji restoration, Japanese family names (Myōji) were also chosen by the individual families in accordance with the family registration law in the early Meiji era. Japanese names are usually written in Kanji, which are Chinese characters that may be pronounced in Japanese in multiple ways. Thus, for every Romanized surname there may be multiple Kanji versions of the word because the process of Romanization converts Kanji characters using phonetics. As a consequence, it is difficult to enumerate the exact number of Japanese family names. However, according to the dictionary of Japanese family names (Niwa, 1996), there are of the order of 300 000 Japanese family names, although the precise number depends on the exact definition of Kanji and upon pronunciation. The exact frequency may be lower as when unique surnames are extracted from a digitalized telephone directory only 150 000 unique Japanese family names are identified. Many Japanese family names derive from place names, occupations and government posts dating back to ancient times.

In a Japanese context the analysis of family names provides a useful dataset for the students to examine geographic patterns of family names and migration flows (Yano *et al.*, 2001). Previous spatial analysis of names has shown that are some commonalties as well as significant differences in the observed geographic distributions of Japanese family

names (Morioka, 1997). For example, Sato (佐藤), which is the most common Japanese name, has an origin derived from the noble name Fujiwara (藤原) clan and the government post of 'Suke' (佐), in the Heian era, is localized in the Tohoku region. Although Sato family names are prevalent in many large metropolitan areas, the highest concentrations remain in the Tohoku and Hokkaido regions. Japanese surnames occur with varying frequency in different regions; for example, the names Higa (比嘉), Kaneshiro (金城) and Ohshiro (大城) are common in Okinawa but not in other parts of Japan.

Japanese data on every family name with a frequency of 200 or more across Japan were provided by the Japanese data company Acton Wins Co., Ltd.[2] This company creates and maintains a Japanese name database with family names and full addresses, sometimes including given names. This database was created by combining a digital telephone directory and a large-scale digital Japanese residential map with every house plate name, each of which details the family name of those living within the building. The Acton Wins database contains 47 million records, each of which comprises family name plus full address details. The database is mainly exploited by commercial companies for direct mail marketing purposes. Such was the interest in the short course that two members of staff from Acton Wins attended two of the initial practical sessions, in order to explain issues of data quality, de-duplication and the sources and operation of errors to the students. Although the dataset is the most accurate names source that is available, there are systematic omissions—such as the low success rate in compiling lists of name places in controlled-access condominiums in urban areas. The data were provided to the students at the level of the 47 Japanese administrative Prefectures that cover both the mainland and islands of Japan (see Figure 2). The complete dataset comprised some 13 000 names, broken down into frequency counts for each Prefecture.

The students were assigned into pairs by local faculty such that each pair had similar sum prior experience and knowledge: no group was without a member with some experience of geography or GIS. Each pair was then assigned a total of 10 family names, of which five were common (a stratified sample from the top of the names distribution file) and five much rarer (taken from the bottom of the distribution). The students were not told that this was the basis to the assignments, however. At a project briefing the groups were presented with a worksheet which introduced the project, outlined the learning objectives, and set the following tasks, building upon the conceptual and technical material developed in the previous lectures and practicals:

1. Create percentages and index scores for the surname distribution across the Prefectures.
2. Create and import the surname database into ArcGIS 9.2.
3. Create a selection of the following choropleth maps:
   a. a Count Score map for each of the 10 names;
   b. an Index Score map for each of the 10 names;
   c. a Percentage Score map for each of the 10 names.

In addition, in order to give the project context, as well as to enlighten the UK instructors and enhance presentation skills, the students were required to undertake:

4. Qualitative Internet and library research into the origins of four surnames, chosen by the students from the 10 names allocated in the first part of the project.
5. Prepare a presentation to deliver at the end of the final day.

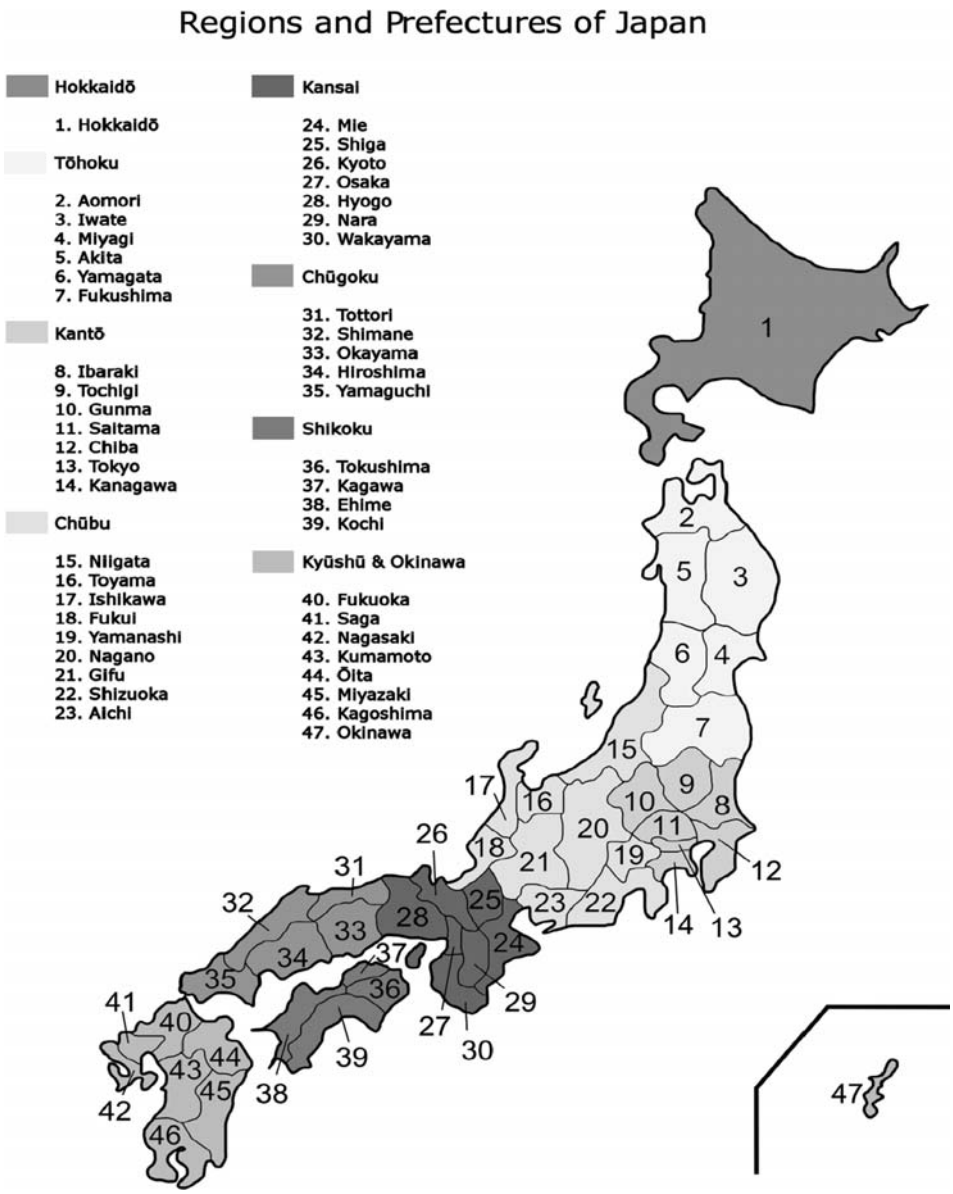


Figure 2. The 47 Japanese Prefectures used for the names analysis. *Source:* Wikipedia: en.wikipedia.org/wiki/Image:Regions_and_Prefectures_of_Japan.png

During the lectures on data representation the students had been introduced to index scores, counts and percentages as methods of representing data. The appropriateness and reliability of each of these measures is different for each of the sets of five 'common' and five 'rare' names. This was not made explicit to the students and as such it was expected that they would discern appropriate measures for the distributions of allotted

'common' and 'rare' names, creating maps with appropriate measures, class intervals and cartographic features (including, but not limited to, clear legends and scale bars and orientation arrows). Tasks 4 and 5 made the course much more broadly based in 'mixed methods' teaching, allowing the students to contextualize the quantitative information on names distributions with more anecdotal information on the histories and characteristics of their allotted names.

Group Project Assessment and Evaluation

The group projects were assessed through the presentations delivered on the final day of the course, each of which lasted for between 5 and 10 minutes—the duration in part depending on whether or not serial translation was required. Each member of each group was required to contribute equally to the presentation. The students were instructed that their presentation should answer or address the following questions (with assessment weighting in brackets):

- Justify the data representations (Count, Index, Percentage) that have been used to display the 10 allocated names (25 Credits).
- Compare and contrast the geographical distribution of the 10 family names, and provide a reasoned justification of where each of the names is most concentrated (25 Credits).
- With reference to the allocated 10 names, set out what the geography of names tells us about people and places in Japan (35 Credits).
- Compare and contrast the observed regionalism of Japanese family names with those that are most common in Great Britain (15 Credits). (Groups were supplied with a list of the 100 most common British family names along with the British family name website address in order to assist with this task.)

Students were advised that 10 credit penalties would be exacted if any of the Virtual Campus practical classes had not been completed satisfactorily by the end of the course.

The students appeared uniformly enthused but had variable success in responding to each of these criteria. A range of slides from the final presentations is available at http://www.spatial-literacy.org/?p=29, and here we will proceed by describing a small selection of the material presented. An example cartographic output, created by students Maiko Kishino and Koreyuki Totok, is shown in Figure 3.

Following analysis of the pattern of index scores, these students discovered that Turugasaki is the name of a district within the Aomori Prefecture. They also identified that the name could originally have been constructed from the words "Turu" meaning Crane and "Saki" meaning Cape: however, after consideration, they concluded that because of the location of the geographic concentration, this name was more probably derived from that of the administrative district. Furthermore, and linking back to the lecture material on scale and uncertainty, the background research conducted by this group suggested that the distribution of the name within the Prefecture was unlikely to be even and, rather, was likely to be concentrated in the district that had taken the same name. This example illustrates how the core learning objectives of the lecture and practical session were reinforced by the brief for the project, and how wider, predominantly qualitative, research reinforced the quantitative analysis of family names conducted through GIS analysis.

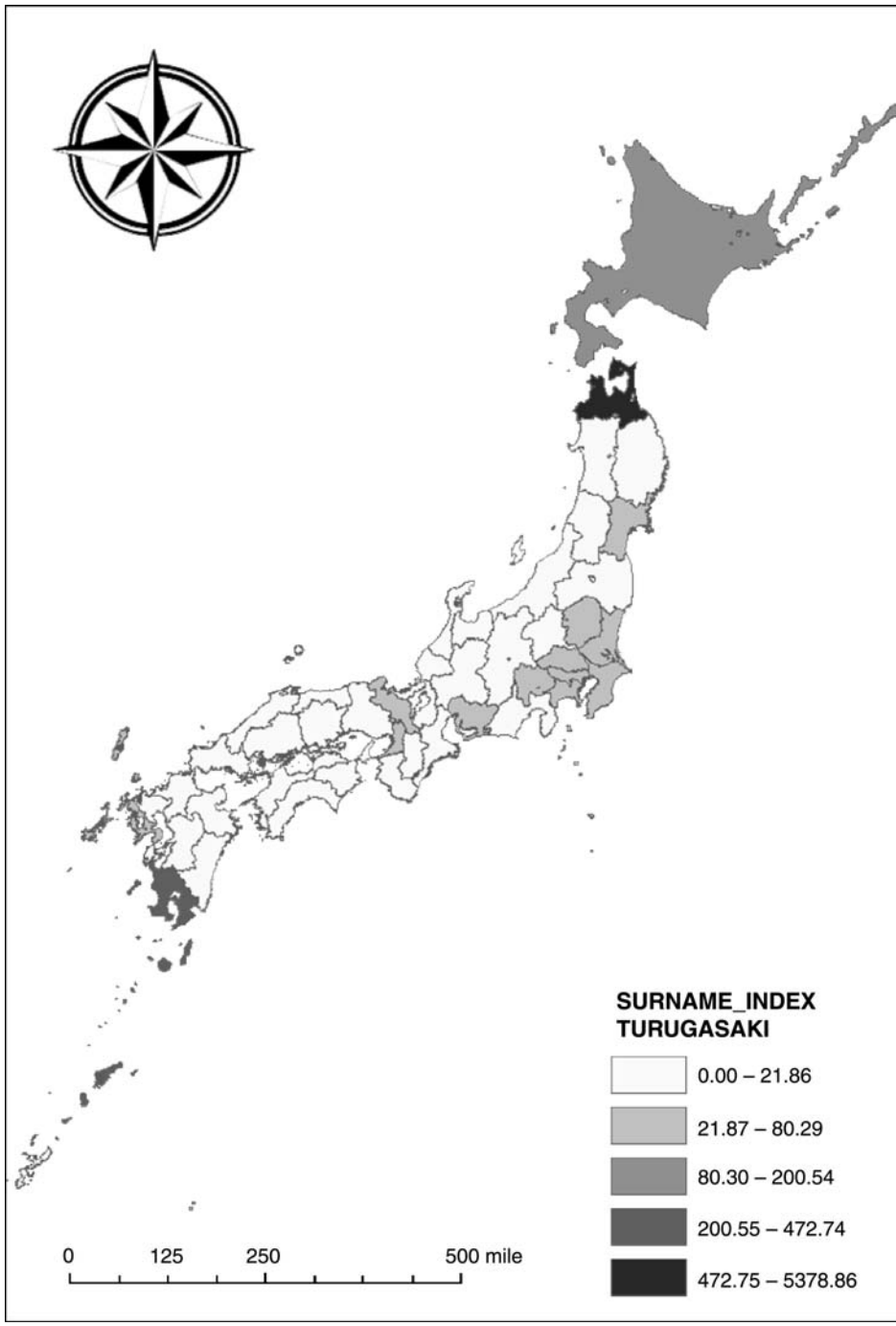


Figure 3. Family name distribution of the 'Turugasaki'

A further theme, unanticipated by the UK course convenors when the project was designed, was the source of uncertainty introduced into the analysis of family name data by transliteration of Kanji script. As discussed earlier, it transpires that Romanized transliterations of family names can have multiple Kanji origins, since the transliteration of Kanji characters is based on phonetics (see, for example, Table 1). Once this problem had been identified in the project, the students were instructed to avoid the issue by choosing the highest frequency form of the Kanji. This identifies a novel source of uncertainty in geographic analysis, and an interesting take on the importance of language in enunciating geographic conceptions of space (Mark, 1999). In terms of the lecture material on uncertainty, it can be taken as a source of uncertainty of geographic measurement, which has knock-on consequences for geographical analysis (Longley *et al.*, 2005, Chapter 6).

In a number of the student presentations issues were raised as to how scale could alter the appearance of their maps and how alternative interpretations could possibly be derived using different boundaries. This point was later developed by Professor Yano with a discussion of his own family name. Because the Acton Wins family database is available at a higher spatial resolution than the extract used for the student projects, maps were created using different areal units to illustrate this discussion. These are shown for prefectures (To-Do-Fu-Ken), municipalities (Shi-Ku-Cho-Son) and street blocks (Cho-Cho) in Figure 4 ((a)-(c) respectively).

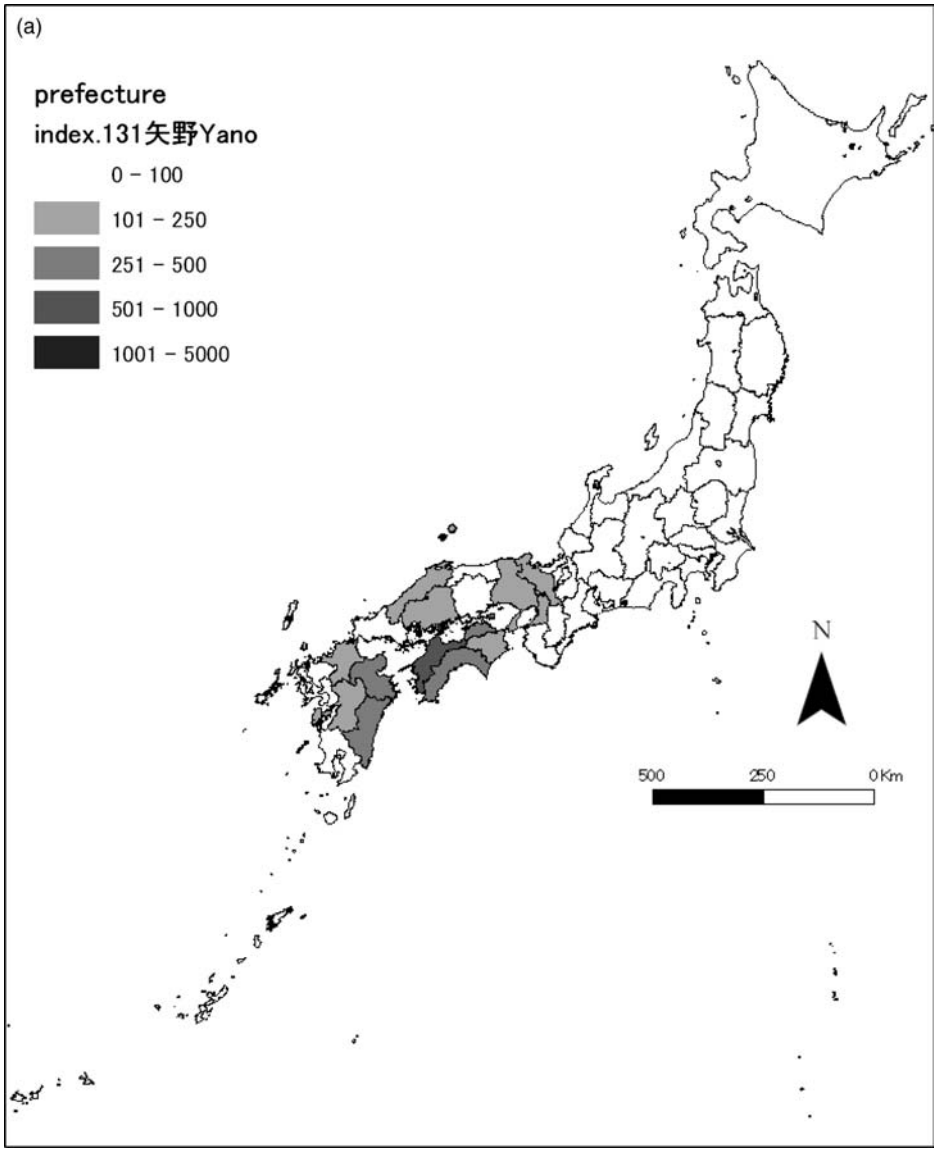
In common with Ritsumeikan University's practice with regard to graduate-level teaching, the evaluation of the course was kept flexible and emphasis was put upon free text responses. These were read and summarized by the local teaching staff. Additionally, a post-course 'party' was used to garner feedback on the course. Feedback was very positive regarding course content, pace of delivery (gratifying given the need for serial translation), level and workload. These evaluation procedures were not core to assessing improvements in student abilities to use the spatial metaphor when engaging with problems, but were more orientated towards general evaluation of course objectives, content and delivery. From analysis of feedback by local teaching staff, it appeared that the emergent student view was that spatial thinking is very important for understanding the patterning of family names mapping in Japan. There were, however, a variety of responses to questions about the difficulty and level of the exercise, perhaps because of the wide-ranging nature of the student group. Feedback also suggested that

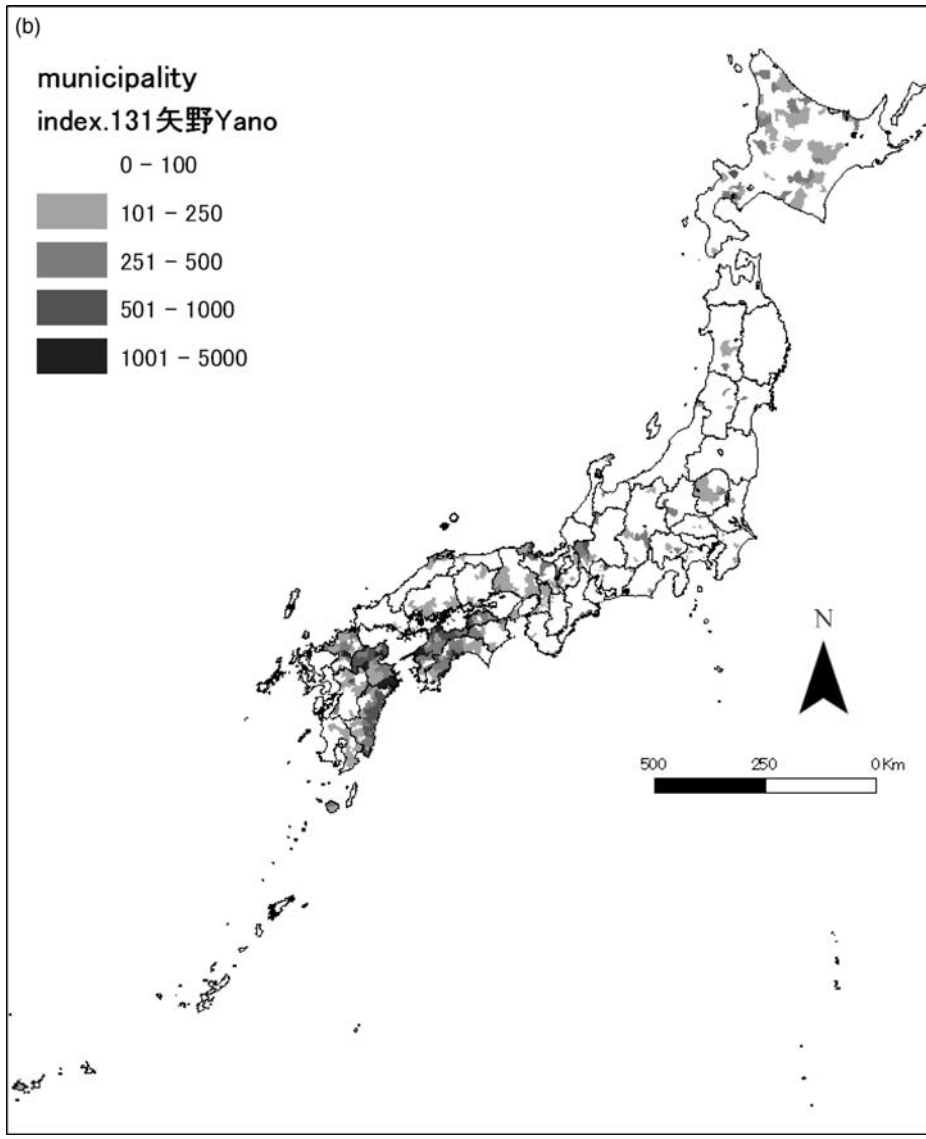
Table 1. Example of the Romanization of Kanji script

Kanji	Romanized	Frequency
阿部	Abe	162 792
安部	Abe	31 848
安倍	Abe	4579
安陪	Abe	284

students were confident in their new-found abilities to infer processes of dominant migration flows in Japan over time; particular examples highlighted in the feedback were issues relating to Okinawa and Hokkaido migrants. Finally, it also suggested that the exercise improved awareness of the nature and scale of international migration from Korea and China. There were no differences in the feedback reported according to gender: the group was approximately 70 per cent male.

One fortuitous aspect of our project design of name allocation concerned the social connotations of names. Some Korean families living in Japan since before the Second World War have changed their family names to Japanese-sounding names—conscious





that they reflect their origin—while others have maintained them with pride. There are also class connotations with some names, and some names suggesting relationship with the Emperor and former upper class families are considered prestigious. In UK teaching we have often asked students to research their own family names, but have always allowed students to substitute the name of a 'friend' for their own, not least because many students have names imported from abroad that are not widely distributed in Britain. Allocating names for analysis does remove some of the interest that a student might gain from researching his/her own family, but does avoid potential social sensitivities.

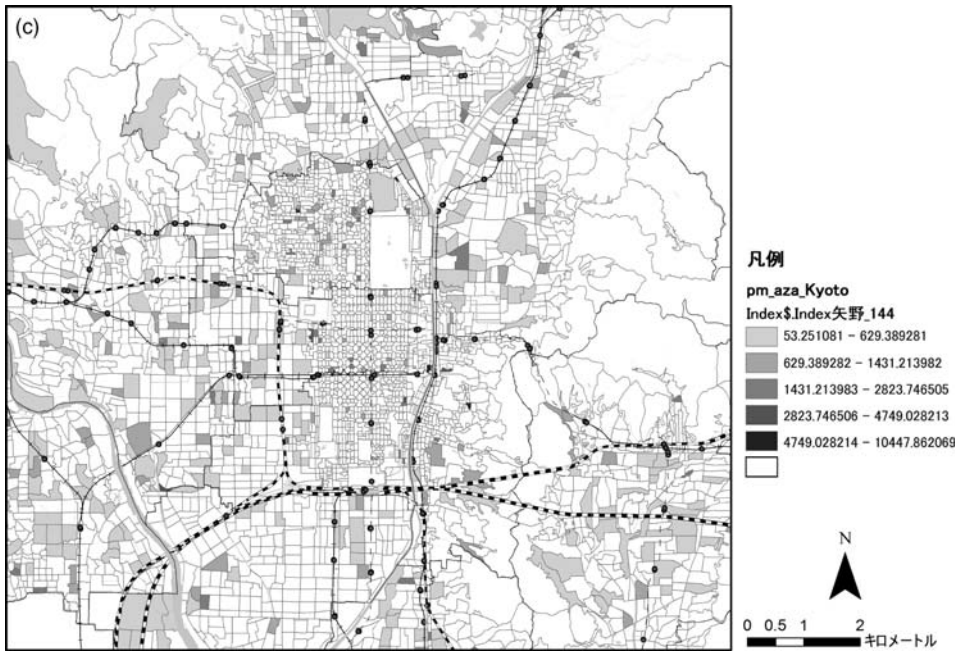


Figure 4. Maps of the name 'Yano' at different scales: (a) Prefecture; (b) Municipality; and (c) 'Chocho' District scale

Consolidation

The title of this article makes the somewhat glib and specific point that systematic GIS-based analysis of Japanese family names is beset by problems of transliteration of Kanji script. This was seen by the group at an early stage as an important problem for Japanese geo-genealogy, and in our shared discovery of the geographies of Japanese family names this proved to be a good way of rediscovering many of the sources and operations of uncertainty that were described in the lectures. The outcome of the presentations made clear that the students all found GIS to be a useful 'lingua franca' or 'geographic Esperanto' to explore the geographic processes of surname diffusion. Along with the qualitative investigation of historical and other sources, it became clear that names analysis can be as successful a way of using GIS to understand migration, mobility and societal change in Japan as in the UK. At the time of writing we are hoping to extend this cross-cultural experiment to develop teaching resources that (a) use GIS to analyse names distributions in other national settings and (b) use datasets from a range of countries in order to investigate international migration flows.

The names coursework was an open-ended assessment that could be tackled by the novice but was nonetheless challenging for the expert. In broader conceptual terms we found the exercise to be one in which neither theory nor empiricism is dominant, and does represent a good example of 'knowledge discovery' through analysis of geographic patterns. In practical terms the course feedback suggested that the course successfully allowed students to bring different levels of technical and substantive

expertise, and deploy them to good effect. The project and associated GIS training had wide-ranging implications for student learning, consistent with the diversity in background, experience and ability of those that took the course. Some of these were location specific—as with understanding of the origin–destination flows of inter-regional and international migration—while others were more general—as with issues of cartographic design in communicating spatial information. We believe that one of the strengths of our approach is that the flexibility and open-endedness of the project enabled students to develop a range of learning skills, as well as their knowledge about Japanese migration and residential mobility. This is particularly apposite given Ritsumeikan University's interest in a major 'digital humanities' research programme on the ways in which digital techniques can enhance our knowledge in anthropology, archaeology, literature and history, as well as geography. Finally, a number of the students are likely to be destined for school or university teaching, and they gained important presentation skills from the closing stages of the project, as well as the use of thematic maps in teaching.

Pratt (2006, p. 84) contends that "[a]ny evidence is only as robust as the conceptualization of the objects that it seeks to represent". Throughout the course the student learning process demonstrated how the tools and techniques of GIS could be used to analyse surnames data for Japan, converting raw geographical facts into information on spatial distributions relevant to generalized quantitative understanding of the origins and historic movements of segments of the Japanese population. As such, the selective choice of data (correcting, for example, for ambiguous transliterations) was used to create and map geographic information that provided evidence of past social and settlement structures and the scale of cumulative migration flows in the period since family names became commonplace. For each of these stages GIS had demonstrated relevance, illustrating how surname analysis can provide insight into past and present human geographical processes. Through the learning paradigm presented in this paper where on- and offline materials are linked through both lecture and independent study, 'geo-genealogy' proved to be an excellent conduit through which GIS training can be effectively delivered in an international setting. It also provides not only an illustration of the ways in which GISs add value to raw geographic facts, but also how geographic information can contribute to an evidence base and build geographic knowledge (see Figure 5).

The focus, histories and major developments in the pedagogy of GISystems and GIScience have typically been promoted as Anglo-American endeavours (Kemp & Goodchild, 1992; but see Yano, 2006). However, this paper has exemplified how developments in pedagogy can be extended and internationalized, thus appealing to a broader audience. Furthermore, this Japanese experience has illustrated how good practice in the teaching of GIScience and GISystems, developed as a direct output from the HEFCE-funded SPLINT programme in England, can be applied in an international setting

Figure 5. Support infrastructure for decision-making. *Note:* See also Longley *et al.* (2005).

with successful results. It is hoped that this exercise can be repeated in the UK with UK data to examine the differences in learning characteristics between university students in Japan and the UK.

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Notes

[1] The PowerPoint files are available from: http://www.wiley.com/go/longley
[2] For details, see http://www.awkk.co.jp/

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