Hong Kong Geographical Association Microcomputer Group

Reply Slip

_____ I am interested in joining the organising committee for the Microcomputer Group

_____ I would like to participate in future activities of the Microcomputer Group

Please fill in the following for reference purposes:

Hardware Available: _____ Apple II or compatible

_____ other types of microcomputer (please specify _____)

Programming Languages: _____ BASIC _____ PASCAL

_____ FORTRAN _____ Assembly Language

_____ Others (please specify _____)

Software Used: _____ Abstat _____ dBASE II

_____ Visicalc/Visitrend/Visiplot

_____ Word processing package (please specify _____)

_____ Others (please specify _____)

Name: _____

Address: _____

_____

_____ Tel: _____

Most Convenient Meeting Time/Day _____

PLEASE RETURN THIS SLIP TO: The Convenors
Microcomputer Group
Hong Kong Geographical Association
Tsim Sha Tsui Post Office
P.O. Box 97553
Kowloon


# THE HONG KONG GEOGRAPHER

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香 港 地 理 學 會

HONG KONG GEOGRAPHICAL ASSOCIATION

通訊地址：香港九龍尖沙咀郵局郵箱：九七五五三號

Correspondence address: Tsim Sha Tsui Post Office P. O. Box No. 97553

The Hong Kong Geographer is the newsletter of the Hong Kong Geographical Association. It serves as a means for relaying news of the Association's activities to its members, publicizing the activities of other institutions and individuals relating to the geography of Hong Kong and its region, and publishing feature articles on topics of interest to members of the Association.

Contributions to the Hong Kong Geographer are welcome. The Editorial Committee particularly encourages articles concerned with any of the following:

*Geographical education: e.g., teaching methods, curriculum, experiences in the classroom

*Application of geographical knowledge to practical settings

*The role of geographers in policy making

Manuscripts should be typewritten and ordinarily should not exceed 2000 words. Submit manuscripts to the Editorial Committee, c/o Dr. Bruce Taylor, Department of Geography, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong.

Opinions expressed in feature articles published in the Hong Kong Geographer are those of the writer and do not represent the views of the Hong Kong Geographical Association, its officers, or the Editorial Committee of the Hong Kong Geographer.

ASSOCIATION NEWS

## Vice-Chairman Elected

At the 16th Annual General Meeting held on March 1, 1986, Mr. Edward S.W. Woo (St. Paul's Co-Educational College) was elected as Vice-Chairman of the Association. Mr. Woo previously had been co-opted for the post by the Executive Committee.

All other office-bearers of the Association remain the same for 1986-87. A complete listing of the 1986-87 Executive Committee will appear in the next issue of the Hong Kong Geographer.

## Constitutional Amendment

Membership dues of the Association will increase beginning in calendar year 1987 as the result of an amendment to Regulation 4 of the Association's Constitution approved at the 16th Annual General Meeting. This is the first increase since 1983 and is necessary because of increasing costs, especially for printing and postage. The new levels of dues are as follows:

Full Membership: HK$50 annually (up from $40)
Joint Membership: HK$75 annually (up from $60)
Corporate Membership: HK$100 annually (up from $80)

The cost of Life Membership will increase to HK$750, or 15 times the level of Full Membership dues, as at present.

## Activities Survey Results

The following responses were received from the Activities Survey distributed with Vol.4, No.1 of the Hong Kong Geographer.

1) Activities. Members' first preference is "field trips/tours in Hong Kong", followed by field study camps,



research projects, academic conferences, and workshops. (Since the survey, a village studies field trip and a microcomputer workshop have been held. Further suggestions are welcomed).

2) Scheduling. Members are equally divided as to whether the activities now scheduled during Geography Day should instead be dispersed throughout the year. (As a compromise, it is suggested that public lectures and discussion forums remain on the programme of Geography Day, while other activities such as field trips take place at intervals during the year).

3) Costs. Most members are willing to pay nominal registration fees to cover costs of an activity.

4) China activities. Most members are at least potentially interested in cooperative activities with geographers in the People's Republic of China. Short trips involving modest expenditures are preferred. (In response to this finding, the Executive Committee has made contacts with the Guangdong Geographical Association and the Geographical Research Association of Shenzhen. Further announcements can be expected later this year).

FEATURE ARTICLE

# MICROCOMPUTERS IN GEOGRAPHY -- THE CHALLENGE

Anthony Gar-On Yeh
Centre of Urban Studies and Urban Planning
University of Hong Kong

The development of the microcomputer has had great impact on our daily lives, on teaching and on research. A small microcomputer with 64K to 256K of random access memory has similar capacity to mainframe computers developed 10 years ago; some have even more capacity. With great reductions in their price and increases in their power, microcomputers are extensively used everywhere -- in offices, department stores, universities, secondary schools and even private homes. Along with their falling prices and greater capacity, their size is shrinking. Undoubtedly we are living in a microcomputer age. Children are exposed to them at the age of three or four and grow up with them. Microcomputers are used to play TV games or for learning at school or at home. Unlike earlier generations, the "joystick" generation should have a good awareness of microcomputers when they enter secondary schools and universities. This presents a challenge to how geography is studied and taught in secondary and tertiary education.

Certainly it is the falling price of microcomputers that has made them available to users in offices, schools and homes. Micros have brought computing capacity that was only affordable by large firms and educational institutions ten years ago within reach of small users. Apart from the price, there are many advantages which microcomputers have over mainframes that make them so pervasive in modern society. First, except for storage capacity and computation speed, they have most of the functions normally found on mainframe computers, along with standard features such as screen editing facilities and interactive colour graphics that are not common on mainframes. Equipped with the necessary software packages, they have a variety of uses -- including word processing, data bases, calculating, programming, and computer graphics. Second, they are portable. They can be carried from one place to another and are suitable for use in geographical field work (Brown and Fox, 1985). Third, they are relatively easy to use, with many user-friendly packages available. Most packages do not require knowledge of computer programming and can be learned rather quickly by mastering a few basic commands. Fourth, they are interactive and personal. Instant responses are received from a microcomputer without a long waiting time for output. It can be used exclusively by one person, and at any time of day -- without the operating hours restrictions often applied to mainframe computers.



Microcomputers can handle most applications with ease, and this makes them widely used in teaching and research. However, micros cannot displace mainframe computers for applications that use large data sets or require lengthy computations. For such uses, microcomputers can be linked to mainframe computers to serve as work stations.

Because of the popularity of microcomputers, they have had a great impact on teaching and research in geography. In the U.K., most university geography departments have at least one microcomputer (Dawson, 1984; Prentice, 1985), and micros are used increasingly in the teaching of secondary school geography (Kent, 1983; Watson, 1984). This trend will continue as the cost of microcomputers is reduced further, making them even more widely available to geographers in secondary and tertiary education. This recent development in geography should not be ignored by geographers in Hong Kong.

## Role of Microcomputers in Geography Teaching and Research

Literacy, numeracy and graphicacy are the basic skills that have long been emphasized in geography. With the development of microcomputers, it is inevitable that computing will be added to these basic skills. Although the microcomputer cannot help us in formulating hypotheses, it is a tool that can help us to analyse our problems and display our research results more quickly. The spread of microcomputing can be considered as a continuation of the "quantitative

revolution" of the 1960s which had a great impact on geography. Constrained by the technology available at the time, only expensive mainframe computers were used. Computing was limited to universities and research institutes and had little effect on secondary education. With the use of microcomputers, computing is more easily available and, hence, has much wider impacts and a greater variety of applications than it did when only mainframes were in use.

A number of functions are served by microcomputers. Their applicability to and relevance for geography teaching and research in secondary and tertiary education varies. Word processing, data processing, statistical analyses, computer assisted cartography, data bases, geographic information systems, mathematical computation and programming, simulation, computer graphics and computer assisted learning (CAL) are some of the common uses for microcomputers. Most of these are used to varying degrees in geography teaching and research in universities and colleges, but not all of them are needed in secondary schools. Figure 1 shows how these functions potentially can be used in secondary and tertiary education.

There exists a "ladder" of microcomputing skills (Reeve, 1985) ranging from familiarity with microcomputers through computer assisted learning to using computer packages, simple programming, and ultimately to professional computing skills requiring knowledge of advanced programming and, possibly, assembly language programming. Students are not required to know all of these skills. In secondary education, it is desirable to expose students to computer assisted learning in lower forms, and gradually introduce them to some simple computer packages in upper forms (Figure 2). In higher education, exposure to computer assisted learning, statistical packages and mapping packages is considered to be essential (Reeve, 1985). However, programming can be regarded as an optional skill, only for students who have special interest in it or who need special courses.

The usage of microcomputers for different purposes and the need for teaching microcomputer skills also vary



Figure 1

FUNCTIONS OF MICROCOMPUTERS IN SECONDARY AND TERTIARY EDUCATION

| Functions | Secondary Education | Tertiary Education |
|---|---|---|
| Word Processing | ✓ | ✓ |
| Data Processing | ✓* | ✓ |
| Statistical Analysis | ✓* | ✓ |
| Computer Assisted Cartography | ✓* | ✓ |
| Data Bases | ✓* | ✓ |
| Geographic Information Systems | X | ✓ |
| Mathematical Computation and Programming | X | ✓ |
| Computer Assisted Learning | ✓ | ✓* |
| Simulation | X | ✓* |
| Computer Graphics | X | ✓* |

Legend

✓ applicable
✓* may be applicable
X not applicable

among different subfields of geography. Subjects related to physical geography, photogrammetry, remote sensing and cartography may use micros more often and require more micro-computing skills than subjects in human geography. It is important, however, for students at least to be familiarised with microcomputers at different levels of their education -- especially in higher education.

## Constraints on Microcomputer Use in Geography

The microcomputer represents a new technology and a new tool for geographers. Although it may become a standard tool in the next ten years, like drawing pens and typewriters there are a number of constraints that limit its use at present for geography teaching and research in secondary schools and universities. A great investment in money, manpower and time is needed to overcome these constraints.

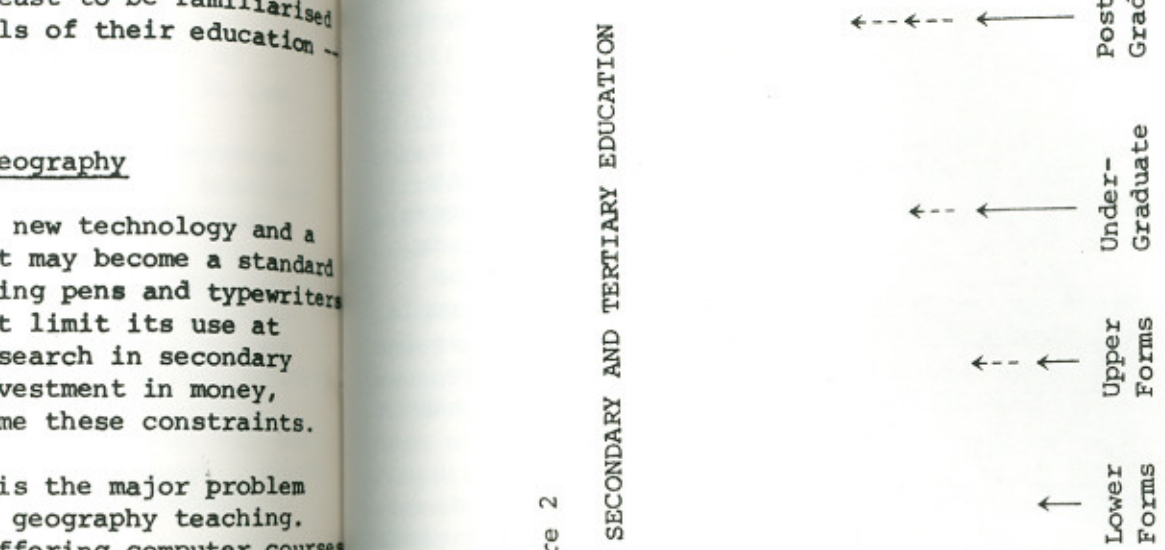
1) Hardware. Lack of hardware is the major problem limiting the use of microcomputers in geography teaching. Although many secondary schools are offering computer courses and have microcomputer teaching rooms, there are still some which do not have such facilities. For those which do, geography has to compete with other subjects for their use and very often has a low priority. In universities and colleges, most geography departments only have a small number of microcomputers which are barely adequate for their administrative needs and for staff research. Few are available for teaching unless centralised microcomputer facilities in computer centres are used. As in secondary schools, geography usually has a low priority in the use of these facilities. Accessibility to microcomputers will become a greater problem as more staff and students become interested in using them.

2) Software. Microcomputers are useless without software to drive them. There is no lack of general purpose software such as word processors, data bases, electronic spread sheets and statistical packages. Fortunately, most of these can be adapted for geographical uses, with their applications dependent on the imaginations of geographers.



Figure 2

MICROCOMPUTING SKILLS REQUIRED IN SECONDARY AND TERTIARY EDUCATION



However, because of their restricted market and the time needed to develop them, there is a limited supply of specialised software for computer cartography, geographic information systems and computer assisted learning. The production of one hour of educational software of professional standard may require many long hours of hard work. More specialised software for geography teaching and research has yet to be developed.

The lack of specialised geographical software is further complicated by problems of transferability. At present there is no universal standard for microcomputers, with different manufacturers setting their own standards and formats. Software developed on one type of machine cannot be transferred easily to another type. For example, there are many good computer assisted learning packages for the BBC microcomputer (Fox et al., 1984), but very few schools in Hong Kong use this micro and its software cannot be used on the more common Apple or IBM micros.

3) Liveware. The need for support of staff and technicians, or "liveware", is often overlooked in considering the use of microcomputers in teaching and research. Just as much as software, liveware is considered as one of the major problems hindering the use of microcomputers in geography (Dawson, 1984). Microcomputers have been popular only since the early 1980s. Many teachers in higher education -- even those who use mainframe computers -- are not yet familiar with them. Much time and effort must be spent in mastering their operating systems and the available software -- not to mention developing new software. It is necessary to train staff who do not have much computing knowledge and retrain those who are accustomed to working with mainframe computers. This requires extra staff time spent away from other research activities, and often staff members do not consider it to be a worthwhile investment of their time and energy. The need for staff training in secondary schools is even more serious. As microcomputers are new to universities and colleges, most secondary teachers were not exposed to them when they were students. Without staff who are themselves knowledgeable and competent in the use of microcomputers, their use in geography will



be limited.

Technical support is less of a problem in secondary schools because mostly centralised facilities are used. However, it is more problematic in university and college geography departments which have their own microcomputer facilities. Very often they lack technicians who can even use them, let alone repair them. In some cases it is left to the staff who use micros in their teaching to maintain them. The technical support geographers receive regarding microcomputers is poorer than the support given in the 1960s and 1970s when centralised mainframe computers mainly were used (Cole and Mather, 1979).

Microcomputers demand much staff time. Writing software, installing and learning to use purchased software, and managing and maintaining microcomputer facilities are very time-consuming for staff who use micros in their teaching. Even more time must be spent advising students who do microcomputer exercises. The time spent with microcomputers often seems to be unrewarding in comparison to colleagues who spend their time on other research activities.

4) Space. Microcomputers, along with their peripherals such as printers, digitizers and plotters, take up space. For microcomputers to be used effectively, especially for teaching, a large room comparable to an average-sized cartography room may be needed. There already is a general shortage of space for other purposes in most geography departments. The need to accommodate microcomputers will add another serious space problem for them.

5) Integration into the curriculum. There already are many skills and concepts that need to be learned by geography students at all levels of their education. Geography curricula often have been criticized for covering too many aspects in too short a period of time, and often in a very diverse manner. How to integrate microcomputers into the already crowded geography curricula in secondary and tertiary education will be a major headache for geography teachers in the coming years.

6) Teaching skills. Geography courses which use instruments extensively, such as photogrammetry, remote sensing and cartography courses, require different teaching methods from courses which do not use them. Similarly, the use of microcomputers requires a different teaching method. A method that can give students confidence in the use of microcomputers and allow for adequate practice is necessary. A teaching style that uses microcomputers as a tool for demonstration and drill may be needed for computer assisted learning in geography (Shepherd et al., 1980; Hassell, 1983).

## The Challenge of Microcomputers to Hong Kong Geographers

It should be apparent from the above discussion that geographers should be prepared to spend money, manpower and time in order to make use of microcomputers in their teaching and research. Using microcomputers is more expensive and more demanding on staff time than are other ways of teaching, especially at the secondary school level. In order to realistically approach the use of micros in teaching and research, geographers should be aware that inflated claims are often made for them and inflated expectations held (Shepherd, 1985). Microcomputers should be treated as an extra tool and a supplement to traditional teaching. However, this tool developed by modern technology cannot be ignored by geographers. Unlike other instruments which are limited in their use to one or two subfields of geography, the microcomputer has wider applications. It can be used in different subfields and at different levels of geographical study. Furthermore, micros are commonly used in other related disciplines, and microcomputer knowledge may be essential for career development of geography students.

There is a significant increase in the use of microcomputers in the teaching of geography abroad (Dobson, 1983; Dawson, 1984; Prentice, 1985). It is time for geographers in Hong Kong to decide whether they are willing to face the challenges created by microcomputers. So that geography students in Hong Kong learn skills similar to those studied abroad, and -- possibly -- so that they are able to find jobs more easily, they should not be passed over by this



modern technology. Some form of microcomputing must be introduced into the secondary and tertiary level geography curricula in Hong Kong, with the expectation that the constraints mentioned earlier can be overcome gradually with time as microcomputers become cheaper and more popular.

The Hong Kong Geographical Association (HKGA) has taken the first step in facing this challenge by organising a microcomputer workshop in January 1986 which aimed at exposing teachers and students to the use of microcomputers in geography.[1] Depending on the amount of interest, similar or more specialized workshops can be organised, and a newsletter on microcomputers in geography might be published in the future. The Geography Section of the Advisory Inspectorate, Education Department may also play an important role by disseminating information on software to secondary school teachers and, possibly, by organising a software library. Most important of all, however, is the introduction of microcomputers into the curricula of universities and teacher training colleges. A new generation of geographers competent in the use of microcomputers must be trained to further promote their use in geography teaching and research in Hong Kong. Without this, the introduction of microcomputers into geography cannot be considered to have really started. Compared with other countries, Hong Kong already has a late start. But it is better late than never!

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[1] The first geography microcomputer workshop in Hong Kong was held on January 11, 1986, sponsored by HKGA. Please send your name and address to HKGA if you want to receive further information on the future activities of HKGA's microcomputer group.

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Editor's note: Dr. Yeh has compiled a more complete bibliography of references on microcomputers in geography which will appear in the next issue of the Hong Kong Geographer.



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HONG KONG GEOGRAPHICAL ASSOCIATION

通訊地址：香港九龍尖沙咀郵局郵箱：九七五五三號

Correspondence address: Tsim Sha Tsui Post Office P. O. Box No. 97553