# CHAPTER 6

# TEACHING AND LEARNING, RESEARCH, AND ROLE DIFFERENTIATION

6.1 The UGC sector is largely financed by public funds. The Government and the community thus have a legitimate interest in whether UGC-funded institutions are providing the highest possible standards of education in the most cost-effective manner. The effectiveness of governance and administration has improved markedly since the 2002 Review Report. They do not require extended analysis here, but should remain matters of constant vigilance and evaluation inside institutions. The general advice offered in Chapter 3 of the 2002 Review report remains valid. In the challenging environment of change that we outline in this report, governing bodies need to be especially mindful of two roles. The first is to check and challenge university management where necessary; the second is their responsibility to ensure future financial sustainability of the institution as evolving strategies bring ambitious new initiatives. However, the principal issues for review in this chapter are teaching and learning, research, and role differentiation. In Chapter 7, we will discuss the tools available to facilitate the development of UGC-funded institutions, including funding methodology, institutions' relationships with their self-financing operations, and efficiency.

## ROLE OF UGC-FUNDED INSTITUTIONS

6.2 UGC-funded institutions are the direct beneficiaries of significant amounts of public funds. We thus believe the UGC sector should be seen as fulfilling four major roles and responsibilities. It should:

(i) provide the high quality teaching and learning that defines the benchmark for the entire system;

(ii) cover the needs of society in terms of comprehensive provision/breadth of graduates, filling "gaps" if they appear and remain unfilled;

(iii) be a key source of future generations of academics – which of itself requires a research dimension; and

(iv) be a key driver/player in research because Hong Kong, as a

knowledge society, needs such a provision and because the private sector is not yet able to supply it.

6.3 Public policy in Hong Kong clearly concentrates funding principally on the UGC sector and allows the private sector to provide for expansion and the access of a wider population to further and higher education. The current structure invests in those institutions and students whose record suggests that they have the greatest potential to benefit Hong Kong in the future. This is a reasonable basis for policy. However, it has two implications. The first is that the transition of students from the self-financing sector to the publicly financed sector must be made as straightforward as possible when talent reveals itself in individuals. We discussed this in Chapter 3. Second, this policy emphasises the requirement for publicly funded institutions and individuals to take account of public need and the general interest, and to ensure that they perform to the highest standard of which they are capable. It is the job of the UGC to ensure that these requirements are met.

6.4 In the following sections and in Chapter 7, we explore ways to assist UGC-funded institutions in fulfilling these responsibilities through the implementation of initiatives at the institutional level, as well as the allocation of funding by the UGC.

## SECTION I. TEACHING AND LEARNING IN THE UGC SECTOR

6.5 Universities are vital sources of knowledge and innovation. They educate students to go into the world with the relevant knowledge, skills and attitudes that can contribute to the development of a dynamic society and knowledge-based economy. In this context, it is imperative for higher education institutions to ensure high quality education, not just for the benefit of students but also for the well-being of the wider community.

6.6 In the current fast-changing world, education does not and cannot mean the passing on of knowledge alone. What is relevant or useful today may not meet future demands. Students need to have the ability to pursue an interest in lifelong learning, and should possess the mental and conceptual skills that equip them to adapt to change and even to steer it. This is indeed the challenge for educators in the higher education sector, particularly those in the UGC-funded sector. At the same time, students should be actively engaged in learning, and in exploring their own learning needs and preferences, which will contribute to the quality of their learning experiences. As discussed above, one of the roles of UGC-funded institutions is to provide benchmark high-quality teaching and learning for the entire system. While universities should be

engaged in research, their primary responsibility is to teach their students to promote their learning and development. This is particularly important to UGC-funded institutions, which are financed by taxpayers who can and should legitimately expect that the money they have invested is used to educate young people so they become thoughtful, self-reliant, adaptable and contributing citizens. Quality teaching is what universities are expected to provide, and the most obvious products of university education are undergraduate students. The emphasis on teaching in no way undermines the importance attached to research. In fact, universities should provide teaching that is based on and informed by research. The interplay between teaching and research will be discussed later in this section. Given the foregoing, UGC-funded institutions play an extremely important role in maintaining and upgrading education quality in the entire higher education sector.

**UGC's Focus on Teaching and Learning**

6.7 It is one of our prime functions to assist UGC-funded institutions in educating their students effectively, which is the core mission and duty of all UGC-funded institutions, regardless of their agreed roles. In pursuit of this, apart from the establishment of the Quality Assurance Council to oversee the quality assurance mechanisms of UGC-funded institutions for taught programmes, we have also invested substantial resources in system-wide initiatives on teaching and learning, such as the Teaching Development Grants ($113 million in the 2009-12 triennium) for UGC-funded institutions to adopt innovative approaches to teaching, improve the learning environment for students and promote the professional development of teaching staff. We also encourage institutions to adopt outcome-based approaches to enhance student learning. To facilitate the institutions in weaving "outcomes" into their new four-year curriculum and to build up their capabilities, the UGC is providing additional funding of about $108 million to its funded institutions over the 2006/07 to 2010/11 academic years.

6.8 More importantly, we have always stated that teaching is *the* primary function of the institutions and, the UGC allocates 75% of the recurrent grant to teaching. However, institutions perceive that funding for teaching is not affected by actual performance, whereas funding for research is. As discussed in the section on research below, as research funding has become more competitive, coupled with the natural tendency of institutions to try to excel in league tables (which emphasise research performance), institutions are driven in many ways to focus more on research. With the increasing emphasis on research, the amount of time and emphasis faculty members are placing on teaching is reducing – at a time when students would benefit from more interactions with faculty members. This has become a major concern. In fact,

one of the most common remarks made to us in our consultations was that the quality of teaching has suffered due to a reward system that is skewed towards research.

6.9 UGC-funded institutions are both the creators and disseminators of knowledge. While the importance of research is evident for a knowledge-based society, this does not (and should not) make teaching a secondary mission of universities. In view of the UGC-funded institutions' primary responsibility to educate their students, and the recent trend to focus more on research instead of teaching, we consider that teaching should be revitalised as a matter of urgency at the system and institutional levels.

Change at the System Level

6.10 At the system level, the most obvious tool for bringing about positive change is funding. Chapter 7 provides more detail of our philosophy on funding for teaching. Here it is sufficient to note that great care must be taken not to reduce the units of resources available for teaching, as ultimately it will be the students who suffer. Yet this does not mean that the funding body should not care about nor evaluate whether institutions are teaching well to enhance student learning. This can be done, although it is certainly difficult, by looking increasingly at outputs and outcomes, and building up reliable data on these.

6.11 A second effective system level approach is positive reinforcement through encouraging institutions to devote more attention to teaching and to helping the spread of good practices across institutions. Funding bodies in other parts of the world have used funding to provide incentives for teaching. For instance, the Higher Education Funding Council for England has identified and funded subject-based Centres of Excellence in Teaching and Learning in 74 universities. The Australian Teaching and Learning Council has an annual budget of approximately A$27 million to recognise, reward and support outstanding teaching and practice in higher education through competitive grants, fellowship schemes and award schemes, *etc*. In the case of Hong Kong, we believe that the UGC should consider providing, on top of the current funding for teaching, competitive grants and invite institutions to develop proposals to enhance student learning at the institutional level or in specific disciplines, perhaps through establishing communities of practice as discussed later in this section.

6.12 Teaching quality may also be enhanced by the provision of professional development for the teaching staff of UGC-funded institutions. University professors are primarily hired for their academic achievement, and good performance in teaching should not be taken for granted. Teaching and

research activities involve different skill sets, and thus it should not be assumed that people who are good at one activity are always good at the other. To improve teaching quality, many universities in the UK require newly appointed academics to undergo some form of training in teaching and learning, and a number of universities offer qualifications for this. In the US, some colleges and universities require graduate teaching assistants to attend classes or undergo training prior to being given responsibility for a course. Some US universities provide instructional support programmes for faculty and teaching assistants. We want to encourage institutions to develop their in-house programmes, which will have to be benchmarked against international good practice and to make participation in these programmes mandatory for newly recruited staff. This initiative should considerably strengthen the teaching staff's professional expertise in teaching and learning at the entry level and, in turn, a culture of professional development within the institutions. The Quality Assurance Council could also review the professional development of teaching staff in its quality audits of UGC-funded institutions, which will help institutions to reflect on whether they have in place mechanisms to ensure that their teaching staff are well equipped for the challenges presented by a fast-changing world.

Sector-wide Surveys and Assessments

6.13 Another possible initiative to improve teaching and ensure high quality throughout the sector is to conduct sector-wide surveys and assessments to enable institutions to demonstrate with evidence how they add value or excel in specific areas of student learning. There are many examples around the world where governments have introduced – or intend to introduce – measures of this nature. For instance, the Higher Education Funding Council for England undertakes the National Student Survey, which surveys all final year students (university by university and subject by subject) and establishes how satisfied students are with various aspects of the teaching that they have received. Despite initial resistance to the survey on the part of many universities, it has now become an established and appreciated part of the system. We have been advised that there are numerous documented cases in which universities have changed their practices in response to the Survey.

6.14 In the US, the National Survey of Student Engagement collects data on the extent to which institutions engage students in active forms of learning. There is also the Collegiate Learning Assessment, which is based on the notion of value-added and which measures, amongst others things, how much students' skills improve during their time at the institution through the use of a pre-test/post-test model. We feel strongly that either the UGC or the Government should initiate surveys and assessments to measure the overall university experience of students and the "value-added" of the education

provided by UGC-funded institutions. One particularly important area of focus is the language proficiency of students in both Chinese and English. These survey and assessment results can provide guidance for institutions to improve education quality, particularly with respect to student learning. We also advocate the publication of these results, which would enhance the accountability and transparency of the institutions.

**Recommendation 21:**

**The UGC should ensure that it uses the tools at its disposal to assess and reward evidence of teaching excellence, both at the system level and at the funding level. Sector-wide surveys and assessments of student learning outcomes should be developed and published.**

## Institutional Focus on Teaching and Learning

### Building Communities of Practice

6.15 Funding and surveys can help steer institutions to better teaching. However, to sustain an institutional emphasis on teaching, a cultural change or a change in mindset will be necessary. One possible way to bring about such change is to provide seed funding to bring together a network of outstanding higher-education educators in Hong Kong to lead communities of practice both within and across institutions. The roles and responsibilities of these communities may include the admission of members and fellows, and the establishment of teaching awards to provide system-level recognition to outstanding teachers. They could also offer high-quality development workshops/courses and promote research on education in the Asian context, with a view to developing these communities into centres of excellence in teaching and learning in Asia that can also reach out to universities in Mainland China and elsewhere. Their operations could be funded by private donations and/or public money. Regardless of the funding source, the establishment of these communities will send a strong message that teaching and learning is being taken seriously. Models of such communities elsewhere include subject-based centres of the Higher Education Academy in the UK and faculty learning communities in the US.

Internal Motivation Drivers in Institutions

6.16 While funding tools could be employed to improve teaching, much more needs to be done at the institutional level. The assessment of teaching staff performance and institutional policies on staff promotion are the key drivers of individual faculty behaviour. These fall squarely within institutional autonomy. To encourage better teaching and hence student learning, institutions need to develop credible tools to assess performance in teaching and consistent policies to recognise and reward good teaching. Many UGC-funded institutions inform academic staff that their expected split of work is 40% teaching, 40% research and 20% community/others. Yet we are aware that individual academics simply do not believe that the 40% teaching is given such weight in assessments, and empirical evidence seems to bear this out. UGC-funded institutions must take steps to correct this gap. The notion that teaching cannot be easily assessed has often been used as a reason for not taking teaching performance seriously, but we have found that this view is not supported by research on the evaluation of teaching. It is indeed possible to assess teaching – it is just that doing so requires determination on the part of institutional management and a considerable amount of work.

6.17 Research has shown that a well-designed system for evaluating teaching must collect data from students, peers, self and administrators, with each evaluator providing information on an area of educational work in which he/she has first-hand experience and is qualified to rate. The first three data sources above (students, peers and self) each have limitations, but together (through triangulation) they represent a valid overall picture. Students, for example, are in a good position to provide information on classroom performance, course delivery and facilities, assessment methods and advising/mentoring, but not on course/curriculum design. Student evaluations of courses provide useful but incomplete data for a purposeful evaluation of teaching. Furthermore, to enhance the validity of student feedback, students should be told what teaching evaluations are for and steps should be taken to show them that their input is taken seriously.

6.18 Peer reviews of teaching are another source of useful information, but reviewers need to be properly trained so that they know what to look for, and the review should include more than an occasional class visit. Self-evaluation constitutes another useful source in the assessment of teaching, in particular through the thoughtful compilation of a teaching portfolio.

6.19 Teaching portfolios have been widely used for the formative and summative evaluation of teaching for close to 20 years in universities all over the world and across many academic disciplines. The idea of a portfolio

approach is to collect a body of evidence, both quantitative and qualitative, to demonstrate an academic's professional accomplishments. The various studies in teaching performance evaluation form a solid basis for institutions to identify ways to credibly assess teaching quality. We recommend that institutions make reference to both local and overseas experiences and develop assessment tools for evaluating the performance of teaching staff that suit the circumstances of individual institutions.

6.20 A credible system to evaluate teaching can help institutions reward and hence encourage good teaching. We have been advised that universities elsewhere have been making strenuous efforts to improve and focus on teaching. For instance, in the UK, while the rank of Professor has traditionally only been available to staff in recognition of their research achievements, the majority of universities now have chairs that take teaching excellence into account as well, and in many cases appointments can be made purely on the basis of teaching criteria. In Hong Kong, many students and faculty members have raised concerns about the lack of proper recognition for good teaching. To address this problem, it has been suggested that institutions should provide different ladders for staff advancement so that faculty members can be promoted for good performance in either research or teaching. While promotion policies fall under institutional autonomy, we would like to encourage UGC-funded institutions to contemplate as a matter of priority how good teaching can be duly recognised through their award/promotion systems. This is necessary not only for the sake of correcting the imbalance between research and teaching, but also because of the increasing international competition for quality students that requires Hong Kong's institutions to upgrade their teaching quality to maintain and enhance their competitiveness in attracting quality students.

A Learner-centred Approach in Curriculum Design

6.21 Traditionally, the design of curricula (including content and delivery modes) has often been "teacher-centred", whereby teachers decide what and how they teach, often based on their expertise or interests. We note the recent advances in learning sciences that have resulted in a body of literature on how students learn, such as in terms of: learner characteristics, including the acquisition and organisation of knowledge, goal directed practice and the importance of motivation and engagement. By understanding these, teachers can design curricula in ways that address student needs, and focus on priority areas. Institutions and individual academics should take account of this literature in their curriculum design and faculty development programmes to improve teaching.

**Recommendation 22:**

**UGC-funded institutions should place as much emphasis on the assessment of competence in teaching as they do on research. They should collectively consider the establishment of communities of practice to promote sector-wide collaboration on teaching and learning issues.**

## The Teaching-Research Nexus

6.22 The academic community generally holds that teaching and research should be closely linked. However, research in this area seems to suggest that even though there are potential synergies between teaching and research in principle, such synergies do not often happen in practice. One useful approach to strengthening the teaching-research nexus is to treat teaching as a legitimate form of scholarship and ensure that it is based on and informed by research. Several specific strategies for enhancing the link between teaching and research are:

- bringing research into the classroom (*e.g.*, adopting an inquiry-based approach to teaching, exposing students to the research process, enriching the teaching content with the latest research findings, *etc.*);
- involving undergraduate students in research projects; and
- broadening the notion of academic scholarship (*e.g.*, recognising research on teaching and learning).

6.23 A number of UGC-funded institutions are working hard to establish and strengthen the teaching-research nexus, and the change to a four-year undergraduate curriculum will provide opportunities to make progress in this direction. This is an area in which targeted support in faculty development will be necessary for frontline teaching staff.

## The Use of Information Technology

6.24 The rapid development of information technology has turned upside down the way students communicate, acquire knowledge and obtain information. This development requires corresponding changes in the delivery of curricula in terms of pedagogy and assessment. Faculty need to be aware of

and able to adopt, as appropriate, pedagogical innovations that have been made possible by information technology, such as software for content creation and dissemination, asynchronous learning and teaching, learning management systems, and social networking via the World Wide Web. Just as important is their ability to understand the learning characteristics of a new generation of students who have grown up with new technology and to adjust their teaching accordingly. Research has shown that innovation in teaching using information technology, amongst other innovative practices, could impact positively on student learning provided that it is based on sound learning principles. With information technology, a great deal of what once could not be done can now be done relatively easily. A notable advantage of using information technology is the possibility of building in more interactive features in the curricula to better engage students in their learning and to provide feedback. With information technology, programme delivery is no longer confined to the classroom, and instead can take various modes, such as online tutorials. Institutions should reflect on how to capture the opportunities provided by e-learning (which should not be confused with distance learning) to enhance the quality of teaching and learning. The "3+3+4" curriculum revision is a good opportunity for doing so.

**Other Learning Support**

6.25 It is of equal importance that support for student learning should be enhanced. An environment that is conducive to student learning should contain supportive hardware and software. Factors such as facilities, learning resources, the educational climate and the culture of the institution all have an impact on student learning experiences. As institutions are gearing up for the four-year curriculum in 2012 (which means new students will be a year younger than the students in the current cohorts), institutions will need to strengthen support for first-year students to help them adjust academically, socially and emotionally to a new environment and learning mode.

6.26 We believe that the UGC should play a facilitating role by engaging institutional leaders in dialogues on ways to promote such a culture and practices. As outlined above, the UGC's own initiatives (together with other external factors) may have, in one way or another, driven institutions to become more research-focused at the expense of teaching. Looking ahead, we will need to ensure that any new initiatives to be introduced will give due regard to the importance of teaching and learning, which should remain central to all endeavours of higher education institutions.

**Recommendation 23:**

**UGC-funded institutions should seek to adopt the approaches outlined in the Review for the improvement of teaching and learning in areas related to faculty development and the strengthening of the teaching-research nexus. They should report on their implementation no later than 2015.**

## SECTION II. RESEARCH

6.27 This section is divided into two parts. In the first part we examine the overall position of R&D spending or investment in Hong Kong, which is by no means confined to UGC-funded institutions. In the second part we review the position of the UGC-funded sector, including the important issue of knowledge transfer or exchange.

### Research and Development in Hong Kong

6.28 We believe that research, in its various forms, will become a vital ingredient in Hong Kong's success. Although it is already a commonplace to say that we live in a "knowledge economy", it is nonetheless a truth. That is especially the case for Hong Kong, which has no natural resources and must survive and prosper on the resources of its people, exploiting those advantages that are open to it through its geographical location and its historical experience.

6.29 In the previous paragraph, we said that research "will become" a vital ingredient in Hong Kong's success. It must be acknowledged that research has not been a vital ingredient to any great extent thus far. For several decades Hong Kong has managed to evolve very well into a prosperous society, without putting significant funding into research from either the private or the public purse. In 1979, the then Advisory Committee on Diversification did not favour Government expenditure on R&D. That reflected the thinking of the time. It was not until 1991 that the Government accepted the advice of the UGC to establish the Research Grants Council (RGC) with annual funding of $100 million.

6.30 Since then, research funding has grown considerably. A significant amount is identified by universities from UGC/RGC funds for research (approximately $4.5 billion per year), and the RGC now disburses about $750 million per annum for research projects. The Innovation and Technology Fund of the Government is projected to spend approximately $1.0

billion on R&D in 2010/11, having been spending from $400 million to $800 million per year in the recent past. Nonetheless, these efforts still pale into insignificance when compared to our global competitors.

## The Quantum of Research Funding in Hong Kong and its Sources

6.31 The 2002 Review Report (paragraph 5.10) stated that total research and development funding (from all sources) in Hong Kong stood at 0.48% of GDP in 1999. This figure lagged far behind all of our economic competitors at the time and was viewed with concern.

6.32 The situation has improved since then, but Hong Kong still lags far behind others. In 2008, Hong Kong devoted about 0.73% of GDP to R&D – some 50% more than the figure in 1999. However, as the table below demonstrates, this was still far lower than other advanced economies, particular in the Asia-Pacific region. At the same time, the breakdown of expenditure between the public and private sector is also of considerable relevance. For all those economies with a significant percentage of R&D expenditure (including Mainland China), the major driver is the private sector and not the government. In Hong Kong, the ratio of public to private R&D expenditure is about 60:40 – in others it is nearer 30:70. In Hong Kong, while public R&D investment is low, it is clear that the main factor absent is the private sector.

**Comparison of the total amount of public and private funding for research expressed as a percentage of GDP in Hong Kong and other advanced economies**

| Economies [a] | Ratio of R&D expenditure to GDP (%) | R&D expenditure by sector | | | |
|---|---|---|---|---|---|
| | | Public (%) | | | Private (%) |
| | | Higher Education Sector | Other Sectors | Total | |
| Australia | 1.84 | 25.7 | 14.1 | 39.8 | 60.2 [b] |
| Canada | 1.84 [c] | 35.0 | 10.2 | 45.2 | 54.8 [b] |
| Mainland China | 1.44 | 8.5 | 19.2 [d] | 27.7 | 72.3 |
| Hong Kong | 0.73 [c] | 54.1 * | 3.1 | 57.2 | 42.8 |
| Japan | 3.78 | 18.3 | 9.2 | 27.5 | 72.5 |
| South Korea | 3.47 [e] | 10.7 [e] | 11.7 [e] | 22.4 [e] | 76.2 [e] |
| Singapore | 2.77 | 20.5 [f] | 7.6 | 28.1 | 71.8 |
| Taiwan | 2.77 | 12.2 | 16.8 | 29.0 | 71.0 [b] |
| UK | 1.82 | 25.6 | 8.8 | 34.4 | 65.6 [b] |
| USA | 2.66 [c] | 13.2 | 10.7 | 23.9 | 76.1 [b] |

• The funding from the UGC amounted to 41.7%.

(a) Australia: Australian Bureau of Statistics, 2006
Canada: Statistics Canada, 2008
Mainland China: National Bureau of Statistics of China, 2007
Hong Kong: Census and Statistics Department, Hong Kong Special Administrative Region, 2008
University Grants Committee, Hong Kong Special Administrative Region, 2008
Japan: General Affairs Division, Statistics Bureau of Japan, 2008
South Korea: Main Science and Technology Indicators, Volume 2008/1, OECD, 2007
Singapore: Agency for Science, Technology and Research, Singapore, 2008
Taiwan: National Science Council, Taiwan, 2008
UK: National Statistics, UK, 2007
Department of Business, Enterprise and Regulatory Reform, 2007
USA: National Science Foundation, USA., 2007

(b) Includes private non-profit sector

(c) Provisional/preliminary data

(d) The research institutes and related organisations in Mainland China are largely government owned and their R&D expenditure is regarded as government expenditure on R&D.

(e) Excluding R&D expenditure in the social sciences and humanities

(f) Including public research institutes

6.33 One final point of relevance is where the public research funds originate from and where they go. The majority of public R&D funds in Hong Kong comes from the UGC and hence goes almost exclusively to UGC-funded institutions. In other jurisdictions, parts of the public sector other than education usually provide a very significant element of R&D funding.

6.34 In conclusion, it is clear that Hong Kong is out of line with its regional comparators (let alone other significant economies globally), to its disadvantage. This is true both in aggregate and in terms of the source of investment. These figures may disguise Hong Kong private investment in R&D in enterprises physically located across the border, which would be registered in the Mainland's figures, but that should not diminish the significance of the comparisons for Hong Kong.

6.35 Can Hong Kong continue to under-invest in research? We believe not. As global competition increases and individual economies exploit their niches to the full, an open economy like Hong Kong cannot afford not to do research in areas that will advance its competitive advantage. Investment in R&D is widely accepted as a key factor contributing to the competitiveness of an economy. Governments in developed economies large and small, service- or industry-focused, have embraced this. Agencies that look at the competitiveness of economies also view R&D expenditures as a key determinant (such as the International Institute for Management Development). There is no doubt that R&D plays an important role in sustaining and promoting

competitiveness.

6.36 Hong Kong requires vigorous investment in R&D to maintain a talent pool of different backgrounds. It depends considerably on the knowledge and ingenuity of its population. A vibrant research environment is essential to attract talents to Hong Kong. Regardless of their background (whether a professional in accounting or IT or a researcher in science or humanities, for instance), all talented people are attracted by the presence of other talented people in the same and related fields.

6.37 Furthermore, having R&D in Hong Kong provides a platform for innovation, which is essential to prosperity. R&D is not only about new products or groundbreaking discoveries. Even in a small, open and service-based economy, R&D is essential to understand, master and apply new knowledge and discoveries. A strong local research base enhances the capacity to take advantage of research conducted elsewhere. This is acutely true in the key service industries that characterise Hong Kong.

6.38 It is clear that the Government has taken this point. In his 2009 Policy Address, the Chief Executive identified six industries (in addition to the four traditional pillar industries of financial services, tourism, trading and logistics, and professional services) for targeted development where Hong Kong enjoys clear advantages: education services, medical services, testing and certification, environmental industries, innovation and technology, and cultural and creative industries. However, it remains uncertain how much investment – particularly in R&D – the Government will want or be able to put into these endeavours and how enthusiastic the private sector will be to join.

6.39 One cannot expect the public sector to carry the major share of total R&D spending in an economy. Given the size of the required investment, this is financially unrealistic. At the same time, however, Hong Kong faces issues that other economies do not. First, although Hong Kong is a Special Administrative Region of the People's Republic of China, it has very limited access to national R&D funds (as discussed in Chapter 5). If Hong Kong were for example Boston, its universities would have access to US federal research funding. Thus, the unique position of Hong Kong as part of, but separate from, China is a disadvantage with regard to access to R&D funding. Second, a similar position obtains with regard to generating more private sector R&D spending in Hong Kong. Hong Kong lacks a vibrant private R&D sector: it seems that businessmen in Hong Kong are not as keen as their overseas counterparts to invest in R&D. Third, again due to Hong Kong's unique situation, it is difficult for Hong Kong researchers to gain access to research intensive industries in the Mainland, such as pharmaceuticals, IT and defence.

6.40 The problems identified above are not intended as criticisms. Rather, they are statements of the position on the ground that needs to be taken into account and analysed further to see if changes or improvements can be made. The UGC has neither the remit nor the expertise to advise the Government on the very complex, multifaceted area of R&D policy and implementation. However we can make the following observations.

(a) The Government should develop further and articulate more clearly its specific R&D policy and what role its various areas have in this. There should be clear policy to encourage the private sector to contribute more to R&D in Hong Kong. The impressive research performance of the UGC-funded sector has created excellent R&D opportunities for Hong Kong, and this should be made known to Hong Kong entrepreneurs. The Innovation and Technology Fund has now been in existence, with its $5 billion initial lump sum injection, since 1999. Its role in pushing R&D further will be crucial.

(b) As set out in Chapter 5, there can and should be a greater role for cross boundary research collaboration and endeavours. This will require a rethink of money crossing the border and more government-level facilitation.

(c) Given the limited funding and nature of research that can receive support from the public purse, Hong Kong's research efforts need to be focused to achieve critical mass and be at the leading edge internationally; and

(d) The public funding that is devoted to R&D is too concentrated from one source – the UGC – and thus in turn from the education funding envelope. This is not healthy. The provision of public funding for R&D should be increased from other policy bureaux and departments. In other jurisdictions, leaving aside defence, these would be the health, commerce, industry and technology bureaux.

A start has certainly been made on some diversification of funding. The establishment of a Theme-based Research Funding stream under the Research Endowment Fund is promising and very welcome. As it is taken forward, this will both encourage the creation of critical mass and collaboration between academics/institutions, and also spur work on issues of particular relevance to Hong Kong. The funding for Public Policy Research (up to 2012) from the

Central Policy Unit, is also innovative. However, these are limited steps so far.

**Recommendation 24:**

**The Government should further develop its R&D policy and ensure that it dovetails more effectively with the four pillar and six new industries identified by the Government for targeted development.**

## The UGC-funded Sector

6.41 In an earlier section, we articulated why we believe it is important that UGC-funded institutions are actively engaged in research. Briefly, we believe in the concept of research-informed teaching. All academics should be at the forefront of knowledge in their field to transmit the latest thinking and developments, and engender a sense of exploration and excitement. There is a strong need for Hong Kong to nurture and develop its own academics, and this requires a strong research element across all major disciplines. Finally, we see a very close and important link between UGC-funded institutions in particular and the research needs of a knowledge-driven society like Hong Kong. As described in paragraphs 6.51 to 6.54 below, all communities are relying increasingly more on their universities for conducting research, not only to enable industry and innovation to flourish, but also to meet social and societal needs. Hong Kong possibly needs this more than most from its publicly funded institutions, because the private sector/industry is not yet carrying its weight.

6.42 Research can take many forms. The Carnegie Foundation has identified four forms of scholarship: discovery, integration, application and teaching. These are designed to show that research is not and should not be narrowly defined as solely, for example, "blue sky" or discovery based. The UGC's Research Assessment Exercise 2006 embraced all four Carnegie forms and the RGC makes no distinction between them in its evaluation of research grant applications.

### Research Funding and Endeavour between and within UGC-funded Institutions

6.43 Research funding to different institutions has varied for both historical and policy reasons. In the early 1990s, Hong Kong started from a very low base in terms of research. It was *ad hoc* in nature, only a limited number of staff had the willingness and ability to supervise research students and there was little or no explicit funding. In addition, some institutions were

newly established and did not have sufficient manpower and financial resources to build up their research capabilities. However, the position has now changed radically. Hong Kong can hold its own internationally in many fields of research endeavour. The culture of research is very firmly rooted here in all UGC-funded institutions, and the total funding available for research has grown very considerably. All institutions have been able to and have recruited significant numbers of staff fully capable of and wishing to undertake research and supervise research postgraduate students. One of the main results of this is that all institutions now actively compete for research dollars and resources and expect to do so on an even footing with other institutions. This has significant implications for the way we should manage and allocate research funding and resources.

6.44 We believe that all UGC research funding and resources should be competitively allocated. This has not been the position uniformly adopted in the past. Most research postgraduate places, for example, are currently allocated without reference to quality or success in research output. We also believe it would be wrong to "anoint" one or more institutions as deserving of additional funding, as such an approach could encourage complacency and the misdirection of scarce resources. Because all UGC-funded institutions are able to and have recruited academics capable of excellent research, all should be eligible to apply and be funded on the basis of their excellence. If this system works well, it should lead to each institutions thinking strategically about the areas into which they should put money and staffing. This should lead to critical masses that further boost excellence. By concentrating research personnel and resources in certain fields, institutions should be able to gain increasingly more resources in those fields.

6.45 This is the position that we have been seeking to achieve. For several years, we have urged UGC-funded institutions to act strategically and focus their research resources, and we have emphasised the importance of role differentiation in research as in other areas. However, there is still too little strategic oversight of research and too little real role differentiation. This applies equally to the comprehensive universities (in one of which 23 research concentrations can be found) and to the smaller/newer institutions. We believe that this lack of strategic focus diminishes the capacity of Hong Kong's universities to achieve their potential.

6.46 To encourage the research endeavours of UGC-funded institutions towards these goals while at the same strengthening role differentiation, we will:

(a) clearly emphasise that we support high quality research wherever it appears in the UGC-funded system, recognising that all

UGC-funded institutions are capable of undertaking excellent research in defined areas; and

(b) move far more of the funding and resources available for research onto a genuinely competitive basis, as set out in Chapter 7.

**Recommendation 25:**

**Research funding and resources should be allocated increasingly on a competitive basis.**

## Functioning of the Research Grants Council

6.47 With the increase of funding to the RGC now coming on stream from the Research Endowment Fund, it is inevitable and appropriate that its mode of functioning and organisation should change. Indeed, the RGC is already rising to the challenge of the Theme-based Research Scheme and the Public Policy Research initiative.

6.48 At present, the RGC's work is assisted by four specialist subject panels, responsible for Physical Sciences, Engineering, Biology and Medicine, and Humanities, Social Sciences and Business Studies. The RGC is aware of concerns that the scope of some panels may be too wide and also of perceived bias in some areas. It is already addressing the breadth issue, and in future intends to allow each panel much more separation of assessment methods to meet other concerns. This should reassure institutions with different roles and strengths that their needs are being properly taken care of and will allow them to differentiate themselves more effectively.

## Access to RGC Research Funding by Private Universities

6.49 One area that needs to be addressed in this report is the position of non UGC-funded institutions' access to research funding granted through the UGC. At present, only academics of UGC-funded institutions are eligible to bid for funds allocated by the RGC. Other staff – both local and overseas – need to partner with a Principal Investigators from UGC-funded institutions to be considered.

6.50 Given the limited amount of funding that has been available for research, this position has been appropriate. Yet as more funds are made available and allocated competitively through the RGC, a re-examination of this

policy will be warranted. While we envisage (as set out elsewhere in this report) that private universities in Hong Kong will be predominantly teaching led, certainly initially, we should not rule out their wish and ability over time to compete effectively for project research funding. We suggest that this policy be reviewed from time to time, with a view to becoming more inclusive of all university level institutional staff.

**Recommendation 26:**

**The access of private universities to competitive research funding should be reviewed periodically.**

## Knowledge Transfer or Exchange

6.51 It would be remiss to conclude this section on research without appropriate reference to "knowledge transfer" – or "knowledge exchange" as it is increasingly called. The higher education sectors of many advanced economies increasingly see knowledge exchange as their universities' "third mission" (alongside teaching and research). It is a direct way in which universities promote the knowledge society and fulfil their function of stimulating innovation. Knowledge exchange is most commonly understood to be a complex process whereby the fruits of research are transformed into commercially viable innovative products. This involves patenting, licensing, early-stage development investment and a set of downstream developments that properly belong to entrepreneurs or corporations.

6.52 At the same time, however, it is important to emphasise that knowledge exchange also includes the transfer of know-how, skills and expertise into applications in the social and government spheres, as well as health, education and the creative arts. Finally, it is equally true that a prime form of knowledge exchange is to be found in the trained intelligence and skills that each year's graduating cohort take out into society with them. Knowledge exchange is by no means simply a matter of technological innovation, giving a premium to applied research. On the one hand, no-one can foretell which part of pure curiosity research will not eventuate in some radical innovation through practical application. On the other hand, knowledge exchange is just another manifestation of universities' practical engagement in the society and economy within which they operate.

6.53 In the past few years, we have been raising the awareness of knowledge exchange in UGC-funded institutions and facilitating them in mapping out their long-term strategies in this area. We have encouraged them

to incorporate knowledge exchange into their mission statements. In 2006, the UGC established a dedicated Knowledge Transfer Working Group to stimulate the adoption of ways of building capacity in this area. We included knowledge exchange in the 2009/12 Academic Development Proposals of institutions. In 2009, at our recommendation the Government earmarked recurrent funding of $50 million per year to build up institutional capacity and broaden institutions' endeavours in this matter.

6.54 It is our view that UGC-funded institutions have responded effectively to these initiatives and that they are in the process of making Knowledge Exchange a natural and integrated part of their actions. While there have been occasional remarkable successes in financial terms from spun-out technologies for some universities in different parts of the world, it is most unwise to expect serious contributions from knowledge exchange to university funding, and especially not on a recurrent basis. Similarly, rather than the occasional spectacular development of a commercial product, it is the continuing flow of research ideas and applications from universities into the economy (together with innovative graduates) that cumulatively provides renewal and advantage.

### The Balance between Teaching and Research

6.55 Finally, we wish to revisit the importance of balance between teaching and research. Our decisions in research, as set out in this chapter, will, if anything, drive institutions even further to chase after research funding. This is not to say that the approach is wrong or faulty: to have outstanding research, there must be competition, and resources will always be scarce. Yet what it does highlight is that we must also be very conscious of this and ensure that proper balance and focus is placed on teaching. We do not underestimate the difficulty in this, but it is essential. Ways must be found both to provide incentives for excellent teaching and penalise institutions that have an inadequate focus on teaching, as assessed in a robust manner.

## SECTION III. ROLE DIFFERENTIATION

6.56 Within the UGC sector, role differentiation has long been one of our policy objectives. The role statements drawn up in the mid 1990s reflected clear role differentiation. The Higher Education Review 2002 strongly advocated role differentiation in general and stated specifically that a small number of institutions should receive focused funding to allow them to compete at the highest international levels.

6.57 In 2004, we published the *Hong Kong Higher Education – To Make a Difference, To Move with the Times*, which articulated our thinking on how to put role differentiation into practice. Eight new role statements were negotiated and agreed on with the institutions. We stated that public resources should be focused on areas of excellence wherever they appeared in institutions across the whole sector. The roles of the institutions should describe an interlocking system, which should be diversified, with different types of strengths or functions predominating in different institutions. This recognised that all the institutions in Hong Kong have their own unique strengths with which they could aspire to "international competitiveness".

## Factors Militating against Role Differentiation

6.58 There is a tendency for all higher education institutions to strive to be research intensive across a broad front. This is driven by an ambition for recognition in the research-based rankings of the international league tables. However, not all institutions can be research intensive to this degree. Funding is not endlessly elastic and the constraints on the public purse are real. As for the other activities of universities, the spectrum of student talent dictates that not all can attract the most academically gifted students and hence should not all teach in the same ways or for the same outcomes. It is vital that the array of UGC-funded institutions meet the needs of the whole society.

6.59 Contrary to some interpretations, we do not wish to implement a demarcation in the UGC sector between "research-oriented" and "teaching-oriented" institutions. Universities are both the creators and the disseminators of knowledge. Thus, it is right to expect UGC-funded institutions to engage in both excellent teaching and research. At the same time, it is not possible for any one institution to achieve excellence in either teaching or research across every discipline, whether pure or applied. All institutions will need to focus their teaching and research efforts in their areas of strength to ensure that the resources are used wisely and effectively, and to promote stellar research and teaching performance.

## Achievement of Role Differentiation

6.60 Achieving successful role differentiation is difficult for the reasons given above. It might be done by having strictly enforced mandates on role, such as through the governing ordinances of the institutions. Indeed, the governing ordinances of the Hong Kong Institute of Education and the Hong

Kong University of Science and Technology do prescribe their "objects". The objects of the other UGC-funded institutions are very general and could not be invoked to enforce a role. In any event, these are blunt weapons that would inhibit growth and development, for which we believe a university must have scope.

6.61 Successful role differentiation might also be achieved by funding allocation. For example, if no research funding or places were granted, it would be very hard for an institution to excel in research. However, we believe in the teaching-research nexus and consider that all UGC-funded institutions should undertake research to a greater or lesser extent. Successful role differentiation could also be achieved by specifying types of programmes that should be funded. This does happen.

6.62 We hope that institutions will themselves identify and adopt different roles – and this also does happen. The missions of institutions do vary considerably. The mission of Lingnan University, for instance, is to be an "internationally recognised Liberal Arts University". The motto of the Hong Kong Polytechnic University is "to learn and to apply for the benefit of mankind".

6.63 There is a clear tension between the desire to allow institutions to have the freedom to do whatever they consider suitable and ensuring the most effective and appropriate use of public funds. With public funding being limited and the allocation per place being generous, we strongly believe there must be mechanisms in place to ensure that scarce resources are being best deployed.

**Recommendation 27:**

**There should continue to be role differentiation between UGC-funded institutions to ensure the best deployment of public resources.**

## Fit-for-Purpose Institutions

6.64 We believe that role differentiation within the UGC sector is essential. As just mentioned, however, the tools available are imperfect and/or create tensions. A significant part of the answer is not to attempt to manage or steer institutions by controlling *inputs* but rather to ensure that the *outputs* meet expectations. These expectations would focus on the quality, breadth and approach of teaching and research, and on students, employers and society. A

focus on outputs will involve institutions ensuring that they are fit for purpose and have cohesive strategies that link their entire endeavours across all levels and activities with their outputs at all levels and activities. Plans to achieve this are outlined in Chapter 7.

**Recommendation 28:**

**The funding regime should assess and reinforce role differentiation and performance in role within the UGC-funded sector.**