

Higher Education in Regional and City
Development

State of Penang, Malaysia

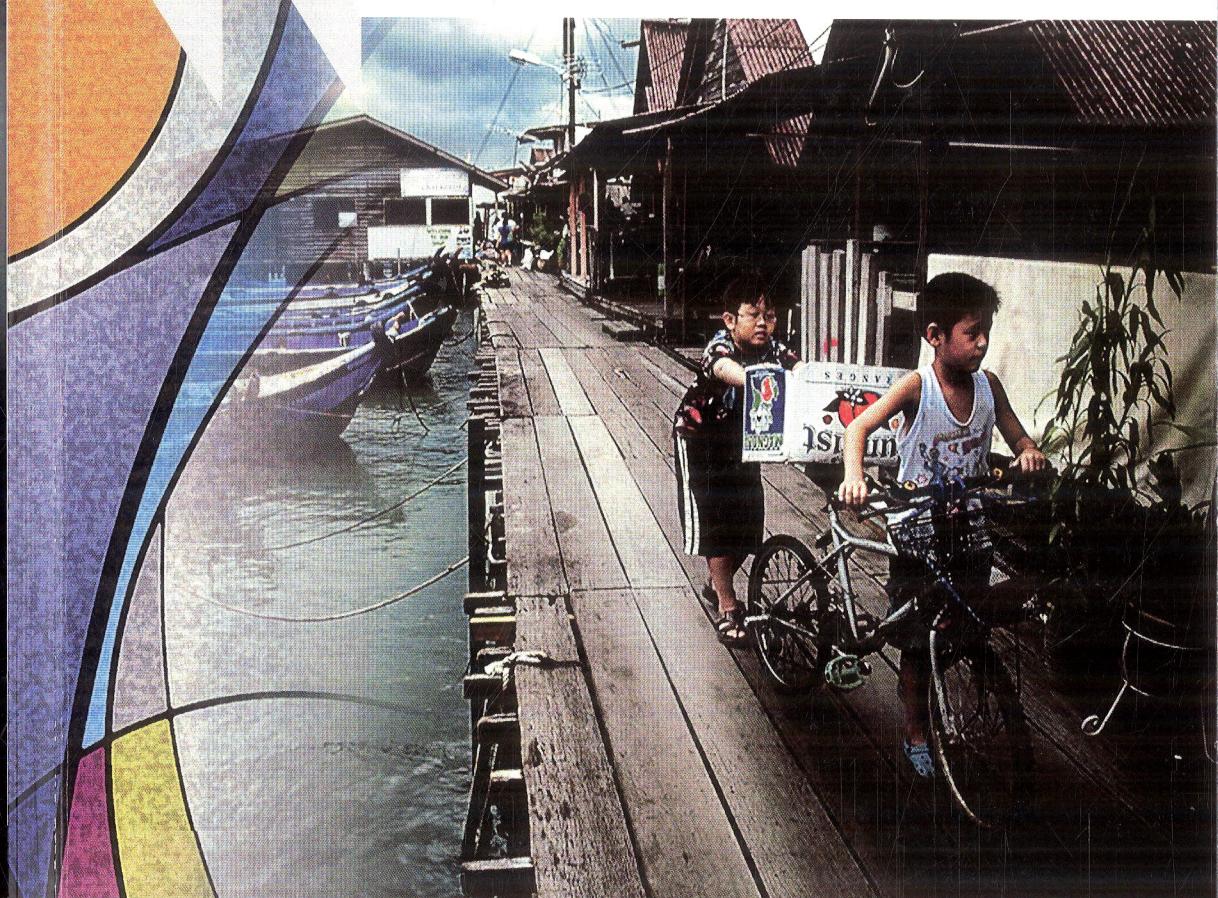


Table of Contents

Assessment and recommendations	15
Chapter 1. National and regional context	47
Introduction	48
1.1 State of the economy	50
1.2. The National Education System.....	51
1.3. State of Penang.....	65
1.4. Higher education in Penang	72
1.5. Economic growth in the region	79
1.6. Higher education and the renewal of Penang.....	84
Conclusion	89
References	91
Chapter 2. Higher education in regional human resource development	99
Introduction	100
2.1. Regional educational attainment	100
2.2. Regional demand for human resources	105
2.3. Engagement of higher education institutions in meeting regional human resource challenges.....	109
2.4 Lifelong learning	121
2.5. Widening access to higher education	121
2.6. System governance, transfer and pathways among institutions	123
Conclusions and recommendations	124
References	129
Chapter 3. Regional innovation in Penang	132
Introduction	133
3.1. Innovation framework conditions, higher education institutions and government policy: Current trends.....	134
3.2. The case of Penang	142
3.3. Higher education responding to regional needs	146
3.4. Challenges and concerns	152
Conclusions and recommendations	158

Chapter 4. The role of higher education in promoting graduate entrepreneurship	167
Introduction	168
4.1 Graduate entrepreneurship support in Malaysia.....	169
4.2 Opportunities for graduate entrepreneurship in Penang	174
4.3 Overarching issues in the promotion of graduate entrepreneurship	187
References	192
Chapter 5. Community health, cultural tourism and sustainability and green growth	195
Introduction	196
5.1. Penang HEIs' contributing to health	196
5.2. Tourism – moving from beach holidays to higher value added segments	205
5.3. Environment and sustainable development	215
Conclusions and recommendations	223
References	230
Chapter 6. Capacity development for regional engagement	233
6.1. Skill requirements for regional development	234
6.2. The role of HEIs to enhance capacity for regional engagement.....	235
6.3. HEIs' modes of engagement in favour of local capacity development	236
6.4. Mechanisms of engagement with local community	241
6.5. Conditions for successful regional engagement for capacity development.....	242
Conclusions and recommendations	247
References	250
Tables	
Table 1.1. Population distribution (%) by ethnic group - Malaysia	48
Table 1.2. GDP per capita income for Malaysia, South Korea, Hong Kong and Singapore (1970 and 2005)	51
Table 1.3. Tuition fees for five field of studies in the public and private higher education Institutions for local students and total government subsidies in Malaysian Ringgit*	57
Table 1.4. Expansion in enrolment by educational level, 1985-2008	59
Table 1.5. Percentage population age 19-24 enrolled in tertiary education	60
Table 1.6. Enrolment in public higher education, 1987 - 2008	61
Table 1.7. Enrolment in private higher education, 2002-08	61
Table 1.8. Number of employed persons by highest certificate obtained, Malaysia, 1985, 1990, 2000, 2001, 2005 and 2008 (000).....	62
Table 1.9. Academic staff by qualifications in public and private HEIs, 2008	63

Table 1.10. Number of Malaysian migrants with tertiary education in OECD countries	64
Table 1.11. Population growth of Penang 1970-2020.....	68
Table 1.12. Population growth of Penang by ethnicity	69
Table 1.13. Population growth, main age groups, dependency ratio and median age in Penang, 1970-2020.....	70
Table 1.15. Profile of students at Universiti Sains Malaysia 2004-08	76
Table 1.16. Gross Domestic Product (GDP) growth rates (%)	80
Table 1.17. Sectoral share of Gross Domestic Product (GDP)	80
Table 1.A.1.1. List of higher education institutions in Penang	95
Table 1.A.1.2. Intake, enrolment and graduates in public HEIs by discipline, 2008	95
Table 1.A.1.3. Intake, enrolment and graduates in private HEIs by discipline, 2008	96
Table 1.A.1.4. Quantity and Quality of research at Universiti Sains Malaysia, 2004-08	97
Table 2.1. Educational attainment, states in Northern Corridor Economic Region, percent with different educational levels.....	102
Table 2.2. Ethnic distribution of Penang population.....	104
Table 2.3. Percentage change in ethnic distribution of Penang population.....	104
Table 2.4. Percentage of employment by industry, Northern Corridor Economic Region and Penang.....	106
Table 2.5. Percent of employment by occupation, Northern Corridor Region (Including and not Including Penang).....	107
Table 2.6. Universiti Sains Malaysia, graduates by field and employment status ..	111
Table 2.7. Assessment of quality of students graduating from local public universities in Penang.....	112
Table 2.8. Enrolment first degree students, Universiti Sains Malaysia, states in Northern Corridor Economic Region and Malaysia, 2007-09	114
Table 2.9. Enrolment post-graduate students, Universiti Sains Malaysia, States in the Northern Corridor Economic Region, 2009	114
Table 2.10. Universiti Sains Malaysia, Monetary assistance awarded to students according to campus, 2008.....	123
Table 3.1 Publication intensity per million population	135
Table 3.2: Normalised S&T performance score of Malaysia vs. Korea and Singapore	136
Table 3.3. Share in world total patents	137
Table 3.4. Selected Malaysian and international universities in the Scimago institutions ranking.....	148
Table 3.5. Collaboration partners when developing technologies locally	149
Table 3.6. USM's Spin-off Companies	151
Table 4.1. A networked system of entrepreneurship support.....	172
Table 4.2. Entrepreneurship education at USM	177

Figures

Figure 1.1. Map of South East Asia	49
Figure 1.2. Map of Malaysia	50
Figure 1.3. Map of Penang.....	66
Figure 2.1. Percentage of the population ages 25 to 64 who have completed tertiary education, OECD Asian Pacific countries, 2008.....	102
Figure 2.2. Percent of population at poverty level in the states in the Northern Corridor Economic Region and Nation.....	103
Figure 3.1. Malaysian patents by region of inventor 1976-2006	146

Boxes

Box 2.1. Problem-based learning at Aalborg University	115
Box 2.2. The Co-operative Education Programme at the University of Waterloo, Canada	116
Box 2.3. PSDC and School2work and FasTrack programmes	120
Box 3.1. Lower patenting activities of Malaysian universities and government research institutes.....	138
Box 3.2. The Penang RIS: trends and prospects	143
Source: Penang economic monthly, October-December 2009 preview issue and May 2010 issue	144
Box 3.3. Sanggar SAINS an innovation complex in the campus.....	150
Box 3.4. The Northern Corridor Economic Region (NCER) framework	152
Box 3.5. Network of Support Centres for Technological Innovation (Xarxa d'Innovació Tecnològica, Xarxa IT) in the region of Catalonia.....	154
Box 3.6. Knowledge Voucher Programme in the Netherlands	156
Box. 3.7. The Penang Skills Development Centre (PSDC) Rationale	158
Box 4.1. Cradle Investment Programme	173
Box 4.2. USM School of Computer Science.....	175
Box 4.3. Cambridge Centre for Entrepreneurial Learning: A “people-based approach” instead of a “how-to-approach”	181
Box 4.4. Matching technology and entrepreneurship at Chalmers School of Entrepreneurship.....	185
Box 4.5. Berlin-Brandenburg's Business Plan Competition.....	186
Box 5.1. The Advanced Medical and Dental Institute (AMDI).....	197
Box 5.2. Universidad Veracruzana: preserving traditional medicine	200
Box 5.3. Frugal Innovation in emerging economies	201
Box 5.4. AARG providing research, counselling and community service related to HIV and AIDS	203
Box 5.5. The growth of medical tourism	205
Box 5.6. Cornell University School of Hotel Administration.....	208
Box 5.7. Programmes to support workforce education, training and development in tourism	209

10 – TABLE OF CONTENTS

Box 5.8. Singapore and creative industries	212
Box 5.9. George Town.....	214
Box 5.10. HEIs in supporting renewable energies and eco-innovation clusters	220
Box 6.1. USM collaboration with NCIA	239
Box 6.2. Eradication of Dengue Mosquitoes: a collaborative project with the Subang Jaya Municipal Council	241
Box. 6.3. USAINS Holding Sdn. Bhd.....	245