Upper Secondary School Curriculum Reform in Cambodia:

Relevance for Employment and Tertiary Education

Final Draft Report (Do not cite or circulate)

UN Leang

Research team leader

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List of Contributors

Leang UN graduated from the Royal University of Phnom Penh and received his M.A. in Philosophy from Ateneo de Manila University, Manila, Philippines and Ph.D. in Social and Behavioural Science from the University of Amsterdam, the Netherlands. His dissertation focused on comparing the role of education in the economic development of Cambodia and Uganda. Currently, he is a deputy director, the Department of Higher Education, General Directorate of Higher Education, Ministry of Education, Youth and Sport, and chief of the Innovative and Development Grant of the Higher Education Quality and Capacity Improvement Project which is co-funded by Government of Cambodia and the World Bank, and implemented by the General Directorate of Higher Education, the Cambodian Ministry of Education, Youth and Sport. He is also a director of the graduate program in education at the Royal University of Phnom Penh, Cambodia. Since 2003, he has been involved in teaching philosophy and recently his teaching has focused on the philosophy of education, educational policy and methods in educational research. His research focus is mainly on education policy. This has included the publication of a policy brief and synthesis paper on the roles of technical and vocational education and training and higher education in Cambodia's economic development, and the contribution of education to the development after the post-conflict period.

Rumreasey CHUON graduated from the Royal University of Phnom Penh, and received her M.A. and Ph.D. in Humanities and Sciences, Human Behavior from Kobe Gakuin University, Japan. After two years working as a consultant for the CDC International Corporation in Japan, she works as a coordinator of the graduate program in education and as a lecturer at the Royal University of Phnom Penh in Cambodia. Her teaching focuses on the psychology of education and research methodology in education. She has authored several articles, including studies on Cambodian scholar's identity (based on the Marcia Identity Concept), the psychology of Cambodian elite students, and on the development of identity. She recently published a book on the psychology of Cambodian elite students and the development of their identity from the civil war to reconstruction.

Karen WALKER, an adjunct academic staff member at James Cook University, Australia, previously taught into the undergraduate and post graduate education programs at James Cook University focusing on pedagogy, guidance and counselling. She served as a member of the human ethics research committee for the university. Her research and publiccations have included a national study of career aspirations of Australian high school youth,

their experiences of school-based career counsellors, and the importance of teacher gender to student learning. She has also conducted research into the social norms mongst first year Australian university students, and transition issues faced by those entering an Australian university for the first time (either as a first year or an international student). Her research in Cambodia has largely been in conjunction with her role of supervision of postgraduate research students as well conducting a small independent study into Cambodian postgraduate experiences. Currently working as an academic volunteer in the M Ed program at RUPP in postgraduate supervision, coursework teaching and mentoring academic staff, she has also had involvement in the development of a career education program in a Cambodian training institute through mentoring staff and modelling classroom work.

Fata NO is currently a lecturer in the graduate education program at the Royal University of Phnom Penh. He is also a lecturer at the Institute of Foreign Languages. His research areas and interests include educational quality, educational inequality, educational planning, curriculum design and development, and language education. He completed his PhD in Educational Development at Hiroshima University in 2012. He has published several articles in peer-reviewed journals and presented his work in several international academic arenas.

Sarom MOK graduated with first class honors in language, majoring in Lao Language and Literature and English from the National University of Laos, Vientiane, in 2006. In 2008, he was granted a scholarship to pursue his master's and doctoral degree at Buriram Rajabhat University, Thailand, and he received his Master of Education in Educational Administration in 2010, and Doctor of Philosophy in Educational Administration in 2013. He is also a Ph.D. candidate in Applied Linguistics, University Brunei Darussalam (UBD). Currently he is a lecturer in the graduate education program, at the Royal University of Phnom Penh. His research interests include leadership, teaching, organizational culture and strengths development, strategies-based language learning, and second language acquisition.

Dinath KIM has been a lecturer at the Royal University of Phnom Penh since 2006. In 2008, she received a Postgraduate Diploma in Applied Linguistics from the Regional Language Center, Singapore. She graduated from the Victoria University of Wellington, New Zealand (2011) with a Master of Education. Her research interests include curriculum development, educational policy and management, assessment, and English as a Foreign Language (EFL).

David FORD is currently a volunteer advisor/lecturer in the chemistry department of the Royal University of Phnom Penh. He holds a Master degree in International Education from Monash University, Australia. His published writing on Cambodian Higher Education has described the historical, cultural and global influences affecting the sector, as well as issues of quality and regulation. He has taught chemistry and general science for thirty five years in Australia, Malaysia, Zimbabwe and Cambodia.

Tharith SRIV joined the Department of Physics, Faculty of Science, the Royal University of Phnom Penh as a lecturer in 2007 and has recently held a position as the Program Coordinator of the M. Sc. Physics Program. His backgrounds are in Physics and Computer Engineering. From 2003 to 2005, Tharith joint the Communication and Multimedia Lab. of the Faculty of Engineering, King Mongkut's University of Technology Thonburi (KMUTT), Thailand. He was awarded a Master of Engineering (M. Eng.) in Electrical and Information Engineering in Oct. 2005. Tharith is a co-author of two international journal papers and three conference papers, as well as a number of research reports.

Tola CHAN is a lecturer at the Royal University of Phnom Penh, Cambodia. His teaching and research interests include curriculum development and textbook analysis, educational policy and management, English as a foreign language (EFL), monitoring and evaluation of educational programmes, and literacy in the developing world. He has recently been reviewing and reconstructing the curriculum and operations for the Faculty of Health Science, UP university in Cambodia. He graduated from Simon Fraser University, Canada (2008) with a Master of Education in Curriculum Development and Instruction, and from the University of Auckland (New Zealand) from which he received a Master of Professional Studies (2011). His other qualifications are a pharmacy degree (2002) and a post-bachelor degree in pharmacology (2004) from the University of Health Science, Cambodia.

Sopheary OU was awarded a Masters in Development Studies from Auckland University, New Zealand, in addition to her previous degree in International Relations from Pannasastra University, Cambodia. She has worked for ten years in the development sector with international NGOs (Concern Worldwide and Norwegian People's Aid) and has had various consultancy experiences (including training and research). Her areas of expertise include rural livelihoods, gender mainstreaming, and good governance. She also has work experience with inter-governmental organisations such as the United Nations for Development Program (UNDP) and the Association of Southeast Asian Nations (ASEAN). She briefly provided ser-

vice to the UNDP as a Parliamentary Development and Gender Officer for the Good Governance Cluster before leaving Cambodia. Currently, she works as a Senior Officer for the Social Welfare, Women, Labour and Migrant Workers Division at the ASEAN Secretariat based in Jakarta, Indonesia.

Eric MOUSSET is an international development consultant who graduated from the University of Paris-6 in 1994 (PhD). Since 2007, he has been residing in Cambodia and participating in a range of local and regional projects. In relation to higher education development, he has conducted a study on skills required by Cambodia-based employers, advised local universities regarding curriculum development, been involved in post-graduate lecturing and research in the social sciences in local universities, and advised the Lao PDR Government with regards to e-learning developments in public universities. In relation to private sector development, he has provided market analysis and strategic advice for a MNC in the technology sector; worked on organisational development and capacity building with local SME's, and has consulted on technology and project management. He is currently a director at the European Chamber of Commerce in Cambodia. He was awarded the 2002 ALSTOM Power Prize for Productive Academia-Industry Collaboration.

Executive Summary

Objectives — The primary objective of the study was to assess the effectiveness of the Curriculum Reform (CR) at Upper Secondary School (USS) —and especially the USS textbooks— in preparing young people for life after senior secondary school. In particular, the study focussed on whether students were being provided with the necessary *technical & vocational skills* and also *soft skills* needed to match the requirements of the world of work, and whether students developed sufficient effective learning skills to successfully pursue university level education. A secondary objective was to examine the connection between upper secondary school textbook content on the one hand, and university foundation year textbook content on the other hand. This involved analysis of whether university foundation year textbook content would naturally develop ideas, concepts and skills beyond that of USS textbook content, or whether cases of overlap or disconnection would exist.

Methodology — The methodology involved collecting the perceptions and insights from two groups whose voices had been left unheard in former studies on this topic. Students who had experienced the implementation of the upper secondary school curriculum reform were asked to express their perceptions about the relevance of textbook material with respect to their workplace or foundation year expectations. The students who were surveyed and interviewed were split into the sub-groups of "employed students"[1] and foundation year students. Subject specialists were invited to review the high school textbooks as well as a sample of foundation year textbooks. A pen-and-paper survey questionnaire probed the following aspects: *High school education background*, *High school subject major and reasons for choice*, *Sources of advice*, *Further education versus employment*, *Reasons for continuing or discontinuing studies after high school*, *Occupation and income*[2], *Technical skills and soft skills demanded in very first job*[1], *Value of school for the world of work*[1], *Employment situation*[3], *Study load*[2], *Preparedness for university studies*[2], *Knowledge gained*[2], and *Pedagogic experience*[2].

Findings — When asked whether high school had prepared them well to enter the world of work, less than 50% of students from the *employed group* responded positively.

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[1] "employed group" or "employed students" refer to school leavers entering the world of work directly after USS

[2] *employed group*

[3] *foundation year group*

When employed students were asked which particular subjects had prepared them well for their current work, *Mathematics*, *Khmer literature*, *Moral study*, and *English* were the most frequently identified. When asked which skills were needed for entering the world of work, perceptions varied significantly according to whether they were employed in the *public sector*, *private sector*, or were *self-employed*. For example, *computer skills* —one of the most frequently cited subjects for which students felt poorly prepared— appeared to be perceived as particularly relevant for beginning a career in the public sector.

Analysis of high school textbooks found that the levels of thinking that students were exposed to across all subject areas and given opportunity to practice were of a *lower order*[4]. Foundation year textbook analysis revealed a highly uneven quality across subjects and between universities. Repetition of content covered in high school textbooks was found to be a common trend across all foundation year textbooks reviewed in the study, with only a marginal addition of new concepts and skills. In at least one case, the content provided in a foundation year textbook was considered to be lower than that of the high school textbooks.

Related studies — Studies such as CAMFEBA (2008) and JICA (2012) have helped identify and quantify skill gaps based on Cambodian graduates' perceptions and Cambodian employers' experiences. These reported a dramatically high proportion of high school students (96%) holding the view that they were underequipped to enter the world of work, paralleled with 87% of surveyed employers who considered Cambodian youth to have either irrelevant (11%) or insufficient (76%) skills. These studies reported *technical skills* as being particularly needed, while also emphasizing the importance of *combined "hard" and "soft" skills* and the difficulties in finding such skill combinations among job seekers.

Conclusion — In principle, the skills needed to enter the world of work and perform well at the workplace were evident in the USS policy document which had described the *intended curriculum* (MoEYS, 2004). The present study has revealed a gap between high school textbooks —the *taught curricula*— and employers' expectations. This is confirmed by the perception of the employed school leavers, by the analysis of the USS textbooks, and by secondary data from related studies. The textbook analysis also uncovered serious deficien-

[4] Based on the Bloom's revised taxonomy of learning, distinguishing between *Memorising*, *Understanding*, *Applying*, *Analysing*, *Evaluating*, and *Creating*

cies in the current textbooks, as well as *the total absence of vocational subject textbooks*. Students were required to perform only at lower levels of thinking, and were poorly prepared for *creative*, *critical*, *original thinking* by USS textbooks. This conclusion is also supported by: a) answers from our foundation year students who commented on insufficient opportunities at high school to develop skills for *teamwork*, *decision-making*, *communication*, and *analysis*. b) the stated views of employers that their requirements for workers with soft skills such as *critical thinking* and *decision-making* still remain very difficult to fill.

Possible explanations for the gap between intended curriculum and taught curriculum may be found in the *lack of suitable resources or teacher capacity*, *inadequate education financing*, *issues with teaching quality at secondary school level*, and *a lack of experience-sharing and knowledge sharing across high school teachers*.

Suggestions for further study — In view of the findings of this study, but also its limitations, it is suggested that an extensive review of all prescribed *primary*, *secondary*, *upper secondary school*, and *foundation year* textbooks across Cambodian schools and universities be conducted.

Given the rapid adoption of digital equipment and applications throughout the Cambodian society in recent years, it was also felt that further exploration of *alternative textbook formats*, especially *digital and online media* extensions of printed textbooks would be worthwhile — keeping in mind potential benefits such as *flexibility with updating, refreshing, and distributing pedagogic content.* Also worthwhile analysing are the patterns of mobile technologies and social media use and uptake throughout society, especially amongst the younger generation. Should such patterns be shown to have continuing importance, policy implications could emerge, for example, that of *addressing the gap between the official textbook-based body of knowledge on the one hand and the organically growing online body of knowledge on the other hand.*

Policy recommendations for the development of hard skills — *ICT/technology*, *Accounting/business*, *Tourism*, and *Art education* skills mentioned in the intended curriculum policy (2005-2009) are relevant skills from the point of view of the labour market's needs, but in actual practice these skills are not developed due to the absence of textbooks and appropriate resources. It is suggested there needs to be the will and commitment at senior policy and administration levels to address this issue, and that resources be made available to remedy shortcomings.

Considering the anticipated speed and extent of structural transformation of the Cambodian economy over the next few years, it would be meaningful if the focus on elective vocational skill programs relevant to anticipated labour market needs was adapted for use and extended and applied in Cambodia at *the regional level*. This implies allowing school principals and other education professionals to have access to current and reliable information on labour market trends.

As an attempt to tackle questions about the quality and accuracy of USS textbooks, it is suggested that MoEYS' *policies have clearly stated learning objectives for all grade levels in each subject area*. These will in turn shape the development of textbooks and other learning materials used in the classroom so that students can master relevant knowledge and skills.

Policy recommendations for the development of soft skills **—** The obligation for an education system to develop individuals with a wide range of soft skills requires a significant revision of both the subject offerings and the textbooks that are the core resources for learning in the classroom. Furthermore, this has implications for the way teachers are prepared and also supported in their teaching.

Policy recommendations for the development of life-long learning skills **—** A curriculum-oriented approach to pedagogy encourages learners to adopt a *surface learning* strategy, skimming through the content rather than developing deeper levels of understanding and application. A balance should be preserved so that students acquire solid foundations in humanities and sciences during early years of learning, then subsequently focus more deeply on fewer areas of interest during higher-grade years.

Among all essential life-long learning skills, *digital literacy* is identified as a particularly high-priority. Therefore it is suggested that the policy should: *(a) Review the curriculum of the current ICT elective vocational subject; (b) Identify pedagogic content that helps students build transferable digital literacy skills; (c) Shift that portion of the pedagogic content to the core curriculum in lower secondary grades; (d) Implement a purposeful teacher-training program in digital literacy*. More generally, the policy should *encourage the making of further connections between relevant online knowledge* and textbook content on a topic-by-topic basis. It is expected that such connections will partly occur through the interaction of stakeholders such as *school principals*, *teachers*, *employers*, *students* and *graduates*.

Policy recommendation for the foundation year concept

It is suggested that *a review of the purpose of the foundation year concept be conducted.*

Chapter I: Introduction

I.1 Background of the Study

Within decades of the end of French colonialism in the early 1950s, Cambodia experienced periods of severe internal political instability and civil war including the total destruction of the country's infrastructure as well as religious and civil society groups during the period of the Khmer Rouge (1975-1979). These experiences have had a cumulative negative impact on attempts to develop the country. Peace and a form of political stability in the early 1990s, coupled with foreign assistance, first under the supervision of the United Nations Transitional Authority for Cambodia (UNTAC), provided new opportunities for Cambodia to develop. Since then positive economic progress can be observed especially in terms of poverty reduction (see Figure 1) and continued economic growth (see Figure 2).

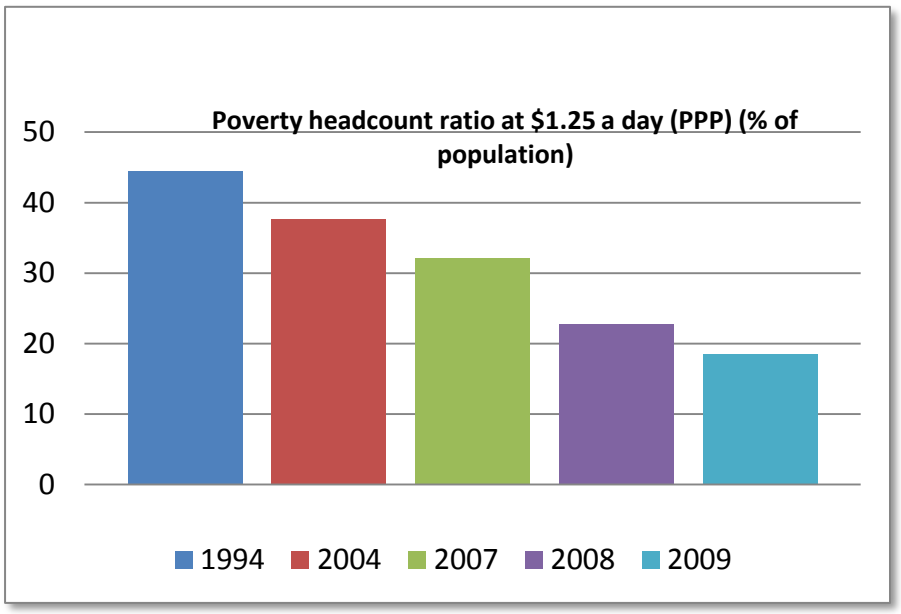

Figure 1. Poverty ratio in Cambodia (Source: http://data.worldbank.org).

Despite two decades of continued economic growth, Cambodia's economic foundation still sits on a narrow base. This is reflected in a high percentage (72%) of the population working in agriculturally related activities (farming, forestry and fishing), or working in a narrow range of secondary industries such as in garment production and the building sector which together employ about 9% of the workforce. In recent years, the service sector which is dominated by employment in tourism and in banking has grown and employs about 19% of

the workforce (NIS & ILO, 2010). Further, National Institute of Statistics (NIS) and International Labour Organisation (ILO) (2010) reports have highlighted that the majority of workers in Cambodia (82.5%) were defined as 'vulnerable workers', that is, they were working as unpaid family members or as 'own-account' workers (see Figure 3). These workers are part of the substantial informal employment sector of the Cambodian labour market which accounts for the largest proportion of workers.

Although the national poverty rate has been substantially reduced in the last two decades, the percentage of the population which lives below US$1.25 per day is still high at 18.6% in 2009. Furthermore, the Cambodian GDP per capita remains low at US$ 946 compared to Vietnam, Indonesia, Thailand and Malaysia which are $1 596, $3 557, $5 474 and $10 381, respectively (http://data.worldbank.org/).

I.2 Cambodia's Worker Productivity and Level of Education

Low productivity among employed Cambodian workers and an insufficiently skilled workforce contribute significantly to low per capita GDP, slow rates of poverty reduction and lack of economic diversification. The productivity of workers on Cambodian factory floors was rated at 35-45% of the regional efficiency level. In general, there is low productivity in both the farm and non-farm sectors. The annual income of Cambodia's working-age population was US$3 400 compared to the ASEAN average of US$10 400 (APO 2010, cited in Heng 2013). The correlation between productivity and GDP per capita and poverty reduction can also be observed among the selected Asian countries in Figure 4 with the exception of Indonesia. The difference between Indonesia and the other Asian countries may due to its large population (as seen in Table 1).

Low productivity levels among Cambodian workers reflect the low levels of human capital development in terms of education and training. According to the 2010 Socio-Economic Survey (SES), the majority of employed workers in Cambodia have only a primary level education (58.1%), followed by lower secondary education, upper secondary education, and post-secondary education (28.5%, 9.8% and 3.4% respectively). A recent ILO (2013) report also stated that 'under-qualification in occupations in low-income countries results in low productivity growth and low capacity for economic diversification' (p.44).

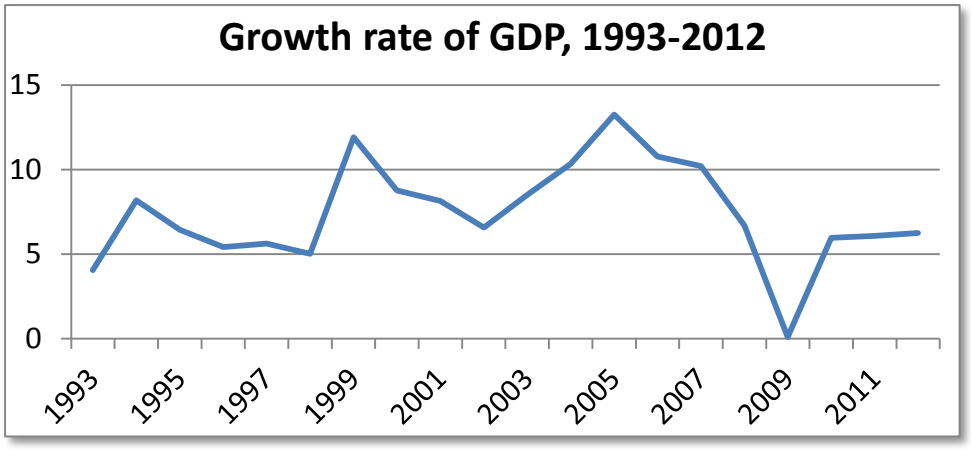

Figure 2. GDP Growth rate 1993-2012 (source: IMF World Economic Outlook, April 2012).

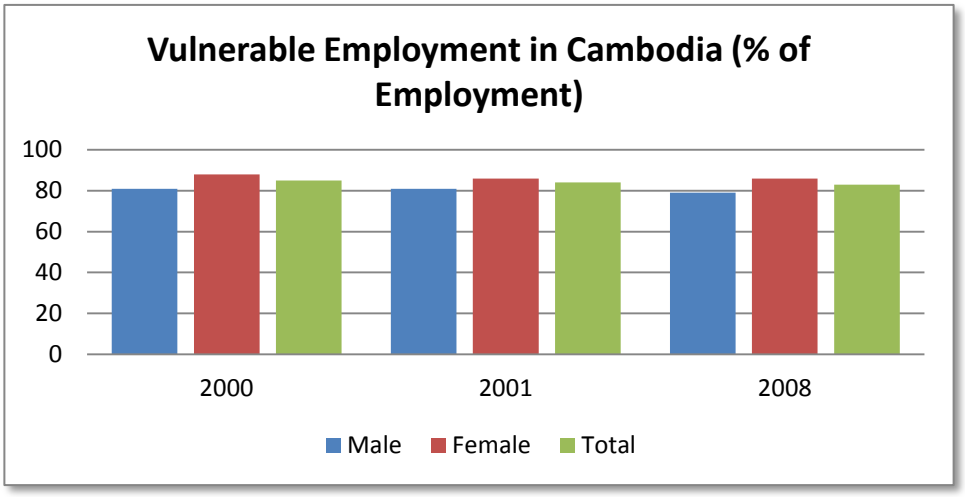

Figure 3. Vulnerable employment in Cambodia.

(Source: http://data.worldbank.org/topic/labor-and-social-protection)

Table 1

Comparison between GDP per capita and poverty rate at US$ 1.25 in selected Asian countries (Source: http://data.worldbank.org/)

Country	GDP per capita (2012)	Poverty rate (2009)
Singapore	51,709	…
Korea	22,590	…
Malaysia	10,381	0
Thailand	5,474	0.4
Indonesia	3,557	18.1
Vietnam	1,596	16.9
Cambodia	946	18.6

In the Cambodian context, statements about under-qualification are often accompanied about the central role of the Cambodian formal education sector in producing individuals who are well educated and prepared to contribute to the country's economic growth and poverty reduction. The education system should equip students with appropriate skills that would also enable them to engage with the regional and international communities in positive and productive ways especially as regional and global integration intensifies.

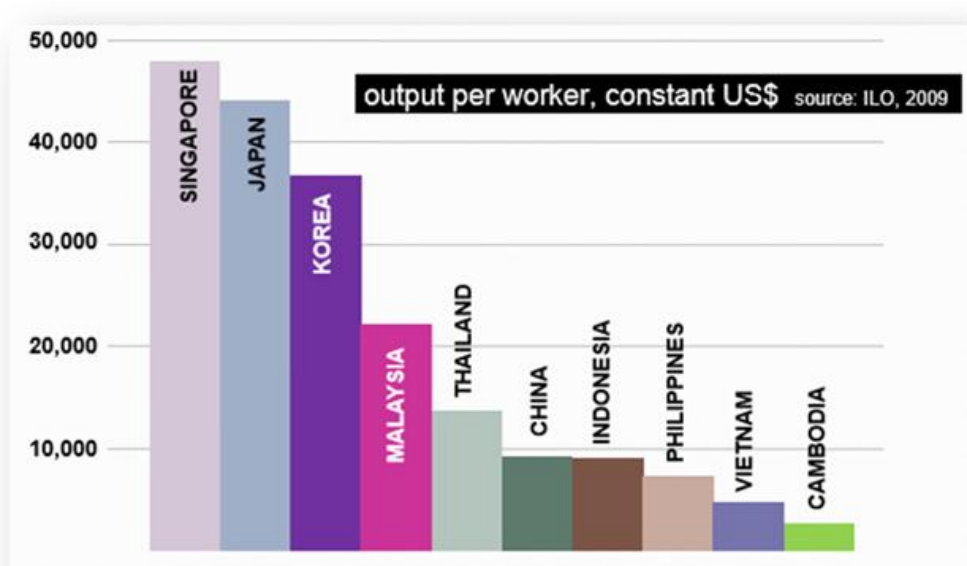

Figure 4. Output per workers in selected Asian countries.
(Source: Prateek Tandon (2012). Putting higher education to work…)

I.3 Cambodian Youth Employment and Education

A 2009 Cambodian NIS Socio-Economic Survey reported that for young people aged 15 – 19 years the employment rate was 70.1% and for those aged 20 -24 years it was 82.9%. What is interesting is that in the ILO's more recent survey (2013) it was reported that labour underutilization of Cambodian youth was found to be at the high level of 64.2%. The term labour underutilization refers to the share of Cambodian youth who have irregular or part-time employment or are unemployed, and who are not in education or training. Further, although the labour participation rate among young people is very high, it is important to note that over the period 1997 – 2007, the unemployment rate for young people increased by 6.3 percentage points, from 1.5% to 7.2%[5], the highest youth unemployment increase in the

[5] The ILO (2013) report noted that in a developing country like Cambodia a young person will find work of any kind because of the necessity for generating income and that this blurs the true figures of un-

world' (CAMFEBA, p.23). Of those unemployed in the 2008 census, 80.7% were considered to be literate, i.e. they had received some level of formal schooling (NIS & ILO, 2010). Further, the number of young people age 14-25 years accessing education beyond secondary education increased from 25.3% in 1998 to 30.9% in 2008 and the trend is still upwards.

Significantly though, the study found that less than one fifth (18.6%) of Cambodia's youth were reported to be in stable employment (NIS & ILO, 2010). The majority of these young people have a secondary school level of education and they are mostly working in the informal secondary and tertiary sectors in the economy. The trend data has revealed that the percentage of the total number of young people aged 15-24 who are working in the secondary and tertiary sectors increased from about 20% to slightly more than 30% between 1998 and 2008.

With the wave of young workforce entrants fast becoming a tsunami there is concern that the Cambodian formal education system has failed to adequately equip these young people for entry to the workforce and this has resulted in low worker productivity amongst other impacts. In 2008 at the first cabinet meeting of the newly elected government, the Cambodian Prime Minister referred to 17 major challenges faced by the government. Among these challenges, a shortage of skilled technical workers and the low quality of educational provision at all levels was identified as a major obstacle to the country's economic development (UNESCO, 2008). The 2009 Investment Climate Assessment (ICA) showed that Cambodia's firms ranked skills as the 9th most important constraint to growth from a list of 18 categories. It is important to note that the percentage of firms reporting skills as a major constraint has more than doubled from 6.5% in 2003 to 15.5% in 2009. Even now the problem remains unsolved. Data from the National Employment Agency (NEA) reveals that from 2010 to 2012 there were approximately 9 711 jobs that required skills with technical and vocational education training (TVET) advertised through its website, but only 2 955 job seekers applied for jobs (http://www.nea.gov.kh/main/).

The high school students surveyed in the CAMFEBA (2008) study overwhelmingly reported the belief that they needed more skills to find a job if they entered the employment

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employment because most youth will become own-account workers or work unpaid for the family business if there is no other work available. Cambodia was one of four countries in the ILO report where two-thirds of the young people were also classified as 'poorly paid'.

sector immediately after school (p.35). There is also a concern that not only those who had some level of formal schooling faced challenges in finding employment, the experience was also common among those with tertiary education. For example, an ADB (2008) report suggested that only 10% of 11 000 university graduates were able to find employment due to their lack of appropriate skills.

It has been estimated that each year up to 300 000 young people seek to enter the workforce in Cambodia for the first time (Situation Analysis of Youth in Cambodia, 2009). This large number of new workplace entrants reflects the 'baby boom' of the years immediately following the fall of the Khmer Rouge regime. As the babies born in the post-conflict years are now approaching adulthood they are seeking further education and employment opportunities in rapidly growing numbers.

I.3.1 Hard skills vs soft skills

In the CAMFEBA (2008) survey of employers (employees were clustered into three groups, the Unskilled Worker, the Specialised Worker and Professional Staff), 64% of the 220 employers in the study reported being unable to find employees with work readiness and technical skills meeting their expectations. The shortage of skills refers not only to the technical or 'hard' skills, but includes the 'soft' skills especially needed among the specialized and professional workers. It is important to note that over half, more than one-third and about one-third of the employers reported struggling to find unskilled, specialized workers and professional staff respectively with a 'good work attitude' (see in Figure 5, Figure 6, Figure 7). This perspective regarding lack of skills is not only being reported by employers, but is also being reported by young people. Amongst the recommendations of employed youth to other youth in the same survey was the recognition that employers valued personal qualities. Some of the areas that these young people identified as needing growth included: good attitude, self-confidence, motivation, being dynamic, and having patience (CAMFEBA, 2008, p.59).

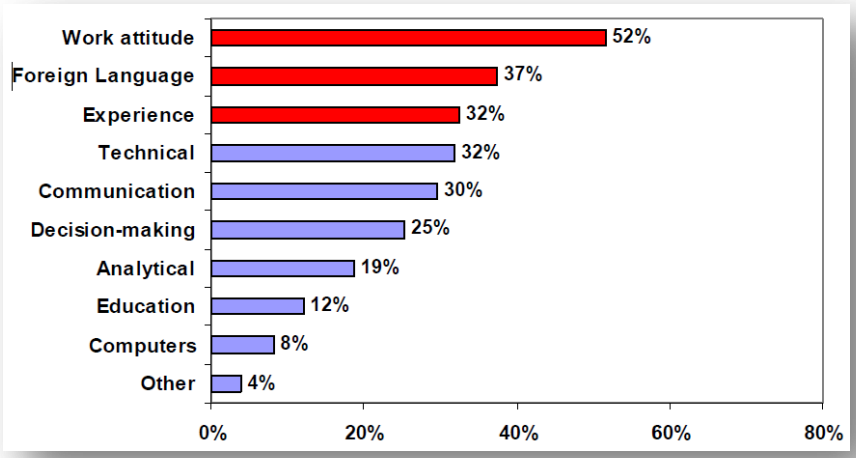


Figure 5. Unskilled workers – Skills and qualities difficult to find.

(Source: CAMFEBA, 2008)

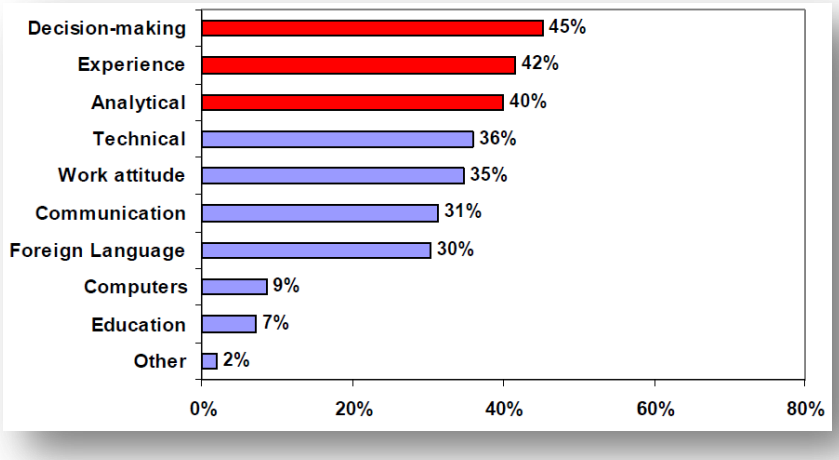


Figure 6. Specialized workers – Skills and qualities difficult to find.

(Source: CAMFEBA, 2008)

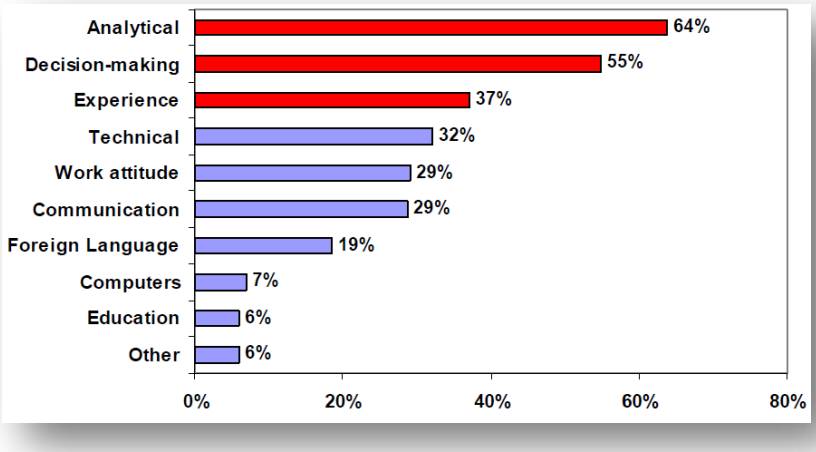


Figure 7. Professional personnel – Skills and qualities difficult to find.

(Source: CAMFEBA, 2008)

The employers' perspective is a useful indicator of some of the challenges facing high school leavers and university graduates seeking first time entry to the workplace. The challenges facing young Cambodians who are (post) high school are numerous, and many are beyond their control as individuals. The lack of employment opportunities in the formal work sector due to the extremely limited range of industries as discussed earlier is an issue requiring a broad economic planning as well as political will. The quality of their educational experience and the relevance of their formal education to their day to day work needs as both educated and productive workers is also a systemic issue as identified by employers and the discussion earlier.

However, the ILO and NIS (2010) also note that it is important not to overlook the considerable numbers of workers in "vulnerable employment" as seen in Figure 3, largely found in the informal economy. These workers are typically among those most likely to be constrained by a lack of education and skills (leading to a lack of opportunities and low incomes) as well as those who are most vulnerable to unforeseen shocks, such as unemployment or medical emergencies (because they rarely make sufficient money to amass contingency savings). Consequently, it is very important that the productivity of these workers is raised so that they can enhance their earnings and move out of poverty.

I.3.2 Cambodia's secondary school curriculum- content

In 2005 a new ministry, the Ministry of Labour and Vocational Training, (MoLVT), was established and was given the responsibility for the coordination, as well as the supervision of, institutes and training centres that provide the technical and vocational workforce for the labour market. These responsibilities were previously held by the Ministry of Education, Youth and Sport. Although there has been an increase in the number of student enrolments in TVET programs under the guidance of MoLVT from 27 894 enrolments in 2005 to 168 630 in 2009, as discussed earlier the increase does not respond to the need of the current or emerging labour markets.

More than half of the 2008 graduates (59.1%) had attended a primary short-term training course (4 – 6 weeks) in a public institution, while more than a third (35.5%) studied in a privately run centre or a training centre run by a NGO or an international organization. Only 2.8% of the 2008 graduates had studied for a technical, publicly funded, primary long-term training programme, and 1.2% had received vocational training at the post-graduate level. (NIS and ILO, 2010)

It is important to note that the increase in enrolments in TVET has been largely due to the increased percentage of enrolments in the total enrolment in the publicly funded, primary short-term training programs from 24.4% in 2004 to 69.5% in 2009. These enrolments were mostly in vocational training and not in technical and mechanical training. The percentage of total post-secondary student enrolments which were in publicly funded long term training and technical diploma programs underwent a decrease from 2.1% of to 0.4% and 4.8% to 1.19% respectively between 2004 and 2009. There was also a decrease in enrolments in technician and post-graduate and graduate levels in TVET from 3.7% in 2005 to 0.79% in 2009. These declining enrolment patterns in technical programs does not meet the numbers of skilled staff needed where more than 50% of the labour force demand was in the industry sector that required technically skilled workers and technicians (NIS and ILO, 2010).

Table 2

*TVET and upper secondary school enrolment in Cambodia (*Source: NIS and ILO, 2010, Data from EMIS*)*

Total enrolment by	TVET (all programs)	Year	Upper secondary school	Year
	24 587	2004	204 925	2005/06
	27 894	2005	222 271	2006/07
	47 986	2006	260 965	2007/08
	88 367	2007	292 423	2008/09
	113 648	2008	334 734	2009/10
	168 630	2009	318 165	2011/12

These secondary level TVET enrolments in Cambodia (rather than primary TVET level) have been very low. The percentage of TVET enrolments at this level compared to the percentage of upper secondary school enrolments has been very low, not only in absolute terms, but also in comparison with other countries.

Table 3

*Percentage of TVET enrolment in comparison with upper secondary school enrolments in selected Asian countries (*Source: UNESCO, 2010, retrieved from **http://unesdoc.unesco.org/images/0019/001900/190007E.pdf**)

Countries	Enrolment TVET, upper secondary (%)	Growth enrolment rate, upper secondary
Cambodia	8	23
Indonesia	33	58
Malaysia	14	53
Thailand	40	67
Vietnam	14	59

In an attempt to promote more student enrolments in the secondary level of TVET, Cambodia recently adopted a diverse education delivery system similar to those in East and Southeast Asian countries as seen in Box 1. In addition to TVET training centres that are under the responsibility of the MoLTV, the MoEYS under its newly established department, Vocational Orientation, has introduced the Technical Secondary School and Resource School (TSSRS) model. However, the numbers of these technical and resource schools are still few. What we are interested in for this study is the general upper second school level, not only because of the high rate of enrolment, but also of curriculum reform introduced in 2005. It is important to note that in 2010, the MoEYS introduced the revised upper secondary school textbooks nationwide, which was in turn an outcome of the Curriculum Development Policy 2005-2009 that aimed to address issues of soft and technical skill development through the introduction of local Life Skills programs and elective vocational education programs.

Recognizing that not all students enter directly into the labour market after secondary education, the revised curriculum also takes into account the cultivation of life-long learning skills for higher education. At the same time, the Accreditation Committee of Cambodia (ACC) introduced the Foundation Year Program aimed at broadening students' knowledge in the social sciences, natural sciences, arts and the humanities, and foreign language, and to prepare students for university level education.

Since the introduction of the Foundation Year Program in 2005 and the introduction of the new upper secondary school curriculum and textbooks, there has been no assessment on whether the stated objectives in the secondary school curriculum are being achieved and what the degree of alignment between content in the upper secondary textbooks and university foundation year programs might be.

Box 1: Education system in selected East and Southeast Asian countries

In Malaysia, Kirchberger (2008) notes that the formal technical and vocational education system starts at the upper secondary school level of education so as to prepare students with technical education for the tertiary level or for the workforce. Technical and Vocational Education (TVE) and skill training in Malaysia is offered by various education and training institutions, however, the public institutions play the leading role. Skill-training standards and certification are coordinated by the National Vocational Training Council (NVTC), which includes representation from the government and the private sector. Secondary Vocational Schools (SVS) provide students with a foundation of academic subjects so that they can choose to pursue their higher learning in technical colleges or polytechnic and the vocational course subjects can account for around 50% of the total course content in the SVS. In the SVS, students have to take the Malaysian Vocational Education certificate examination (called Peperiksaan Sijil Pelajaran Malaysia Vokasional [SPMV]) and students with excellent performance may proceed to higher learning at local Higher Education Institutions or enter the job market. Moreover, the SVS or the Secondary Technical Schools (STSs) also provide skill training programs for lower secondary school leavers who did not go through the Malaysian Certificate Examination or the Vocational Education certificate examination (SPM/SPMV) (Kirchberger, 2008). Graduates of the skill training programs are allowed to take tests given by NVTC, and they can then enter into the formal labour market[1].

In Thailand, Kratchusanti (2009) points out that the provision of vocational education varies depending on the types of program of vocational education and fields of study. Thus, the TVET programs are diversified and offered in formal and non-formal institutions, and in the workplace or as dual courses. TVET is offered at various levels: upper secondary level (grade 10 – 12), as diplomas in vocational education, through higher education in technical education, through bachelor degrees in technology/performance, and in short-course vocational training[1].

In Vietnam, after the completion of lower secondary education, students have to take an entrance exam to proceed to either upper secondary education for three years or secondary technical vocational education (TVET) for 3 or 4 years in order that they are able to pursue their studies to higher education. UNESCO (2007) indicates that those who complete lower secondary education have several choices including continuing with their schooling at upper secondary school or professional secondary schools, or undertaking vocational training. The TVET system in Vietnam is developed in several forms. The one to three years vocational training programs are for students who have graduated from lower or upper secondary education. Upon the completion of the program, students can be employed to work as skilled workers. The two to three year vocational and technical education program combines general education subjects and specific technical subjects. After the program, students can enrol for a higher education degree. Several other forms of TVET, up to 12 months duration, are also available such as formal, informal, continuous in-service training and these are available through a variety of providers: public, semi-public and private institutions. It should be noted that there are the two strands of formal education at this level, upper secondary education, and professional secondary education which are conducted in separate schools by separately trained teachers, and which are managed by the provinces under the aegis of the MOET (UNESCO, 2007). According to the Professional Education Department of MOET (2006), TVET is not popular among young people as they hesitate to choose it due to a number of reasons including limited resources for TVET, for cultural reasons, and because of poor quality training programs which cannot be pursued to higher learning at universities.[1]

According to the Institute of Research on Educational Development (2011), equivalent to the upper secondary schools but different from post-secondary Vocational and Technical Education schools, the Vocational and Technical Schools include two sub-systems: vocational schools and centers specializing in training skilled or semi-skilled workers; and the technical vocational school specializing in training intermediate practitioners in the fields of education, economics, technology, culture and art. This type of school is exclusively for students who want to pursue a high school diploma but did not pass the entrance exam for the general public school, or for adults who are older than the upper secondary school students' age[1].

The TVET system in Vietnam is quite complicated as it is under the state administration of MOET, Ministry of Labor – Invalids and Social Affairs (MOLISA), and other line ministries at the central levels for such activities as planning, recruitment of staff, specialized occupational standards, retraining of teaching staff, forming partnerships with industry or foreign training institutions, and promotion. Furthermore, Vietnamese TVET institutions are managed by different government authorities at national, provincial and district level (Dernbach, 2010). Dernbach (2010) also points out that MOLISA / General Department of Vocational Training take an overall responsibility for TVET[1].

I.4 Research Objectives

In light of the implementation of these new policies, this research aimed to explore how well the upper secondary school textbooks prepared young people for life after school in terms of equipping them with the technical and vocational skills and soft skills needed to enter into the world of work, and the acquisition of appropriate learning skills for those pursuing university education.

A second objective of this research was to assess whether the university foundation year textbooks were a continuation and development of material/topics/ideas covered in the revised upper secondary school textbooks, whether they were largely a repetition, or something unrelated.

I.5 Research Questions

This study seeks to determine the extent to which the Curriculum Reform (CR) at Upper Secondary School (USS) has prepared young people for life after senior secondary school. It wants to determine whether the Foundation Year Course curriculum was building on material already covered or was a repetition of high school material. This investigation has been guided by the following three questions:

To what extent has the Curriculum Reform at upper secondary school equipped young people with technical and employability skills for entering the world of work directly from secondary school?

To what extent has the Curriculum Reform at upper secondary school equipped young people to pursue university study directly from secondary school?

To what extent do the Foundation Year textbooks broaden/deepen the ideas/concepts/material covered in the textbooks used in high school?

Chapter II: Review of the Literature

II.1 Aims of Education

Typically a nation's government defines the general aims of education. The aims of formal education in a society is a topic that has been vigorously discussed and debated for as long as formal learning has been part of any society's DNA. Two dominant discourses exist in the debate with several others adding varied themes to the discussions. The dominant discourses regarding the purpose of education can be summarized briefly as, 1) to provide an educated citizenry that will engage at all levels of society and, 2) to provide skilled workers ready to enter the world of work and contribute to a country's economic development. These are of necessity brief sketches of the debate but it is nonetheless important to be mindful of their existence and some of the tensions that exist between the two perspectives.

For many decades, governments around the globe have put emphasis on the economic value of the school curriculum. Brady and Kennedy (1999) claimed that a 1992 OECD ministerial communique that commented on future challenges was the prompt for increased government interest in education. The communique said, in part, 'A basic policy goal permeating education in all countries is to increase the productivity of human resources so as to enable more valuable output of work, and thus allow higher wages and/or profits in the economy as a whole' (p.5). Business people were identified as also having a strong interest in the nation's school curriculum seeing it as the means of providing their workforce with students with the requisite knowledge and skills to become productive workers.

Once national educational goals have been established, the 'curriculum can be organised around key learning areas rather than divided into many discrete and seemingly unrelated subject areas' (UNICEF, 2000, p.5). National education goals need to be linked to national assessment, school curriculum and teacher training curricula (UNICEF, 2000, p.7). In sum, the national education goals provide a framework for developing a national curriculum.

II.2 Curriculum: A Contested Concept

This study acknowledges that there are many aspects of a nation's curriculum including: the intended curriculum, the taught curriculum, the learned curriculum, the hidden curriculum, and the null curriculum. For the purposes of this review we have focused on the intended curriculum (as seen in the policy documents), the taught curriculum (as seen in the textbooks) and the learned curriculum (as revealed in comments of recent students).

Intended curriculum

National education goals, which are usually set by a government's education ministry, provide the framework for developing a nation's intended curriculum. It is a statement of what is intended to be taught and learned in schools across all levels of formal education. Therefore, the intended curriculum refers to the formal, approved guidelines for teaching content to pupils that is developed for teachers and/or by teachers (UNICEF, 2000, p.10).

Taught curriculum

This term refers to what is taught by teachers in the classroom. When teachers are engaged in mastering the intended curriculum, they also need to consider the context of their learners and how students prefer to learn and then adapt their practices to best enable their students to learn. They may also need to consider the resources available to them in their learning environment and develop strategies that take into account resource availability in helping students learn and reach specific standards of performance. However, as in many countries, especially poor developing countries, textbooks are often the only resource available to teachers, the taught curriculum becomes virtually equivalent to what is provided in the textbooks.

Learned curriculum

The learned curriculum consists of what sense students make of the written and taught curriculum and how they organise, apply, and represent their new understandings.

The learned curriculum is not only what may be learned formally, it also refers to the values, attitudes and knowledge that a student is exposed to during their time in school.

What skills learned in school can students use? What knowledge and attitudes do students acquire? What do they absorb or ignore? Educators try to answer these questions by establishing desired learning outcomes in advance of teaching and by assessing student performance afterward. However, pupils learn other things in school besides the intended curriculum.

Hidden curriculum

Teachers, administrators, and the ways in which schools are organized often communicate messages that are not officially included in the formal curriculum. These include, for example, the value given or not given to team work, whether consultative or non-

consultative decision making styles are used, the attitudes towards cheating and plagiarism, and the type of communication styles used.

II.3 Purpose of the Curriculum

In this study we focused on the upper secondary school curriculum. The debate about the purpose of upper secondary school curriculum is whether it should produce graduates with technical and vocational skills, graduates with sound general/academic knowledge, or a combination of both.

Advocates of vocational education point to the economic advantages of a vocationally oriented curriculum. The aim of a high school vocational curriculum, sometimes referred to as 'technical', 'practical' or 'applied' training, is to 'prepare students to acquire an education and job skills, enabling them to enter employment immediately upon high school graduation' (Lynch, 2000, p.1). This vocational focus is clearly evident in the curriculum of those parts of formal education systems where there is vocational education and training with the emphasis on the achievement of competencies in order to gain a recognised qualification. The focus on breaking learning into small components and developing a list of competencies that are then measurable or quantifiable, usually through some form of demonstrated behaviour, is an adaptation of management thinking that includes simplifying work through a division of labour and managing and measuring the outputs of each division.

Although there is no strict operational definition of vocational education, the following courses are often taught for the purposes of the general labor market in Western countries and modern society: word processing (typing), introduction to computers, technology education, agriculture, business and office skills, marketing, health care, family and consumer sciences, trade and industry, technical communications, public and protective services, childcare and education, food service, hospitality, and personal and other services (Lynch, 2000).

An increasing recognition that people need more than simply the technical or 'hard' skills or knowledge to perform effectively has resulted in educational organizations also focusing on the development of students' non-technical skills. There are a wide range of terms used to describe these "non-technical" skills, including "generic skills", "essential skills", "soft skills", "transferable skills", "enterprise skills" and "general capabilities". Many of the frameworks used to describe these non-technical skills include not only skills relevant to employment, but also broader capabilities relating to participation in society such as "citizen-

ship" or "ethical behaviour"' (Department of Education, Employment & Workplace Relations, 2012).

Employers have increasingly discussed the importance of new skills crucial to employees' ability to work effectively such as: knowing *how* to learn, interpersonal skills, competence in applying general education (reading, writing, calculating, computing) to workplaces, ability to work in teams or groups, effective listening and oral communications skills, adaptability and flexibility, personal management skills with good self-esteem, personal and workplace ethics, leadership or initiative-taking skills, and seemingly above all, the ability to think and to solve problems in workplaces. Many of these skills were once reserved for those in mainly management level roles however today they are considered necessary for individuals at all levels of employment.

The realization that education is *not only* about skills and knowledge acquisition has underlined the value of providing a quality general education recognizing the need for an emphasis on flexibility and basic knowledge that can be used to learn many different occupational skills and tasks across an individual's lifespan. Following this trend in education, Pearson (2011) identified the need for a shift in emphasis amongst development agencies from the training in technical skills (a common feature of capacity development organisations in developing countries including Cambodia) towards developing people with *process-oriented* skills, often referred to as soft skills.

Soft skills, a term increasingly appearing in literature on education that discusses the preparedness of individuals for post-school destinations, have been usefully classified by the World Bank (2006) into two separate groups, one group including thinking skills such as critical and creative thinking, and the second group consisting of behavioural skills, for example, self-discipline and persistence. Soft skills influence how people interact with each other and include such abilities as communication and listening, creativity, analytical thinking, empathy, flexibility, and problem solving' (p.15).

These competencies and skills have also been described as 'employability skills'. The idea that employability skills need to be considered along a developmental continuum and that they are developed over a person's lifetime was pivotal in the conceptualisation of employability skills. Likewise, the model of five stages of development from novice and advanced beginner to competent, proficient and finally expert was identified as a valuable conceptual framework for learners and employers. Understanding that expertise is also context specific was an important insight that recognised that 'employability skills…cannot be demonstrated or assessed without understanding or recognition of the context in which the skills are being used' (Department of Education, Employment & Workplace Relations, p.5). Box 2 illustrates one nation's attempts to make connections between the formal learning of school and the wider world of work.

In general, these technical and employability skills will not be introduced until children finish their basic education, usually at the level of junior or lower secondary school. When finishing junior or lower secondary school, different countries have different systems of introducing more vocationally oriented knowledge and skills. In some countries, such as Germany, the Netherlands, Korea, and Turkey the government determined that in order to have well-trained workers with vocational and technical skills, they needed to create a separate educational track or pathway for those who would like to enter the labour market directly. These young people will choose to take the vocational track in their senior years of formal education whereas those who would like to continue to a universi-

Box 2

In order to provide students with relevant skills to enter the world of work as well as for life outside the workplace, Singapore introduced two important learning strategies. First is an applied learning initiative that will help students see the relevance of what they learn in the classroom. The second is a learning-for-life program that is intended to help students develop character and values. It is important to learn from the Singapore case that secondary schools also invite polytechnics to design curricula for learning-for-life subjects and that secondary students also attend lessons conducted by polytechnic staff.

NGEE ANN SECONDARY SCHOOL
1. Evaluate mobile-phone plan of telcos in Singapore using graphs and equations, and come up with their own.
2. Design carparks that will optimise space at the school, using trigonometry principles.

WEST SPRING SECONDARY
1. Design posters and brochures and come up with video advertisements about environmental conservation, combining content from humanities and sciences.

JURONG SECONDARY
1. Walk to Jurong Lake to learn about its geography and biodiversity.
2. For social studies, go to common areas to talk to residents and understand how social bonding occurs among residents.

Source: TENG Amelia (2013). Preparing students for life in real world: New schemes will help them apply textbook knowledge, develop value. September 28, 2013. The Straights Times.

ty education can elect to study in the more academic track.

However there is awareness among educators, academics, social activists, as well as the general public that this type of distinction between the vocational and academic tracks may result in some students, parents and teachers seeing the vocational pathway as a second-class option which may produce worse outcomes for students. Levin and Segedin (2011, p.14) write that since a student's choice of job destination is often related to their social class background, school systems with very specific tracks or streams can end up segregating students based on socio-economic status. This can lead to significant equity challenges. The problems associated with separate tracks can also be magnified because students frequently change their intentions during or after their secondary education. Dual systems cannot provide the flexibility that students need in these circumstances and this can further disadvantage them.

In response to this critique, some countries offer different types of upper secondary education. They not only have separate technical and vocational training centres, but they also offer vocational and technical subjects in the general upper secondary school system. This is based on the recognition that not all students will want to go on to university education. Two different programs are introduced to students and those students who would like to enter the labour market directly after school can choose subjects related to their technical and vocational interests, and those who want to go to university can choose more academically oriented subjects. This is presently the case in the Cambodian secondary school system.

II.4 Textbook Development

A nation's curriculum determines both the scope and the sequence of what is to be taught and learned as well as specifying the time to be allocated for areas identified as being fundamental to learning. Developed to reflect the scope and sequence of the curriculum, textbooks then need to be written for use in the classroom. They should 'follow …clear, well organized scope and sequence of curriculum', and this should be combined with a regular cycle of curriculum review which can then lead to curriculum goals and textbooks being updated and renewed in a timely manner (UNICEF, 2000, p.7). In developing countries like Cambodia which have poorly trained teachers and limited classroom resources, the textbook is often the only teaching resource used by both teachers and students. Having well designed textbooks in such countries is critical to the quality of learning in the classroom.

II.4.1 Bloom's revised taxonomy of learning

The development of the individual student's skills of analysis, synthesis and creative thinking has increasingly been a focus of education systems across the globe and its inclusion as a stated outcome of formal learning in many countries gives some sense to the value ascribed to the idea. Further, given the importance of analysis, synthesis and creative thinking skills as discussed in the soft-skill section earlier, the textbook developers should not only focus on the technical and vocational facts, theory and knowledge, but need to include the skills of analysis, synthesis and creative thinking into the subject matter.

Bloom's original Taxonomy of Learning Objectives was developed in 1956 and was one of the earliest attempts to describe the types of thinking that occurs in learning. It has also provided a framework that has been used to promote the teaching and practice of higher or more complex forms of learning than simply remembering and recall. Teaching the skills across Bloom's cognitive domain has occurred in a number of education systems across all educational levels (compulsory and post-compulsory education) in an attempt to produce individuals with well-developed, critical and flexible thinking skills (there are also the psychomotor and affective domains in Bloom's taxonomy). In the original taxonomy of the cognitive domain there were six levels of thinking and in the Bloom's Revised taxonomy six levels of thinking have been described (from lower to higher level): remembering; understanding; applying; analysing; evaluating; and creating.

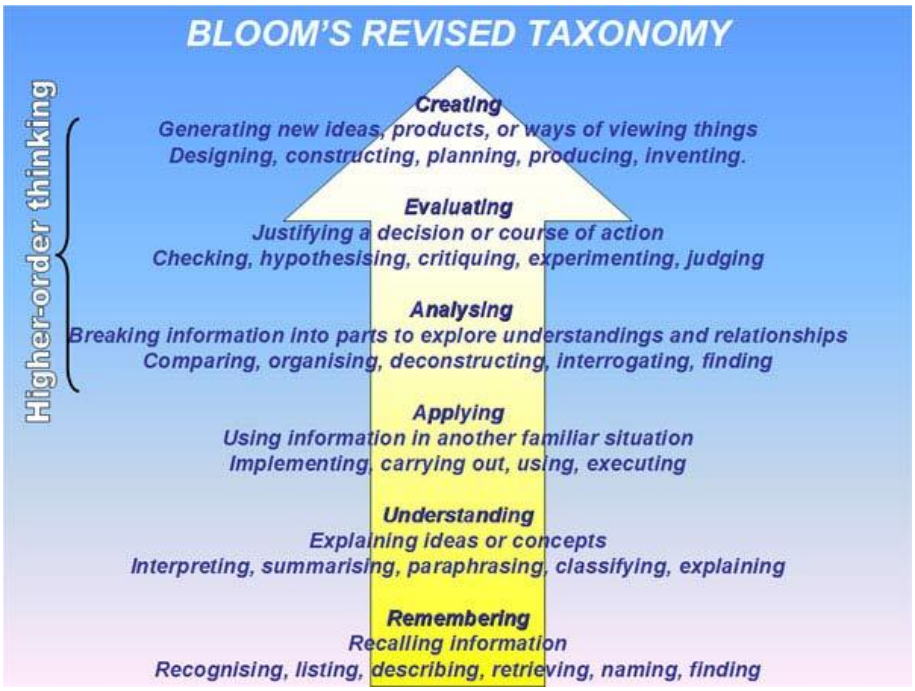


Figure 8. Bloom's revised taxonomy of learning objects.

Other frameworks have since emerged as educational researchers have refined and developed the initial ideas (for example, the SOLO taxonomy), but the essential notion that there are levels or categories of thinking that can be developed through intentional teaching and learning in the classroom has become embedded in many of the contemporary approaches to learning and teaching. One widely used resource all schools have that can be usefully adopted to develop students with skills in higher levels of thinking are the textbooks and workbooks used for content coverage in subject or key learning areas. Analysis of the types of thinking being developed in a subject area and the frequency of the application of specific types of thinking is easily done through textbook analysis especially through an analysis focusing on the types of questions and learning activities within the textbook.

There are numerous examples of textbook analysis being used to identify the types and frequency of thinking skills being taught and reinforced in both prescribed as well as non-prescribed textbooks. The analysis of a lesson or a unit of work's stated learning outcomes or learning objectives is also a useful approach in determining the type of thinking being developed in the classroom (see for example, Riazi & Mosalanejad, 2010).

II.4.2 Cambodian textbook development

The attempt to develop and modernise Cambodia's population through the formal education system after gaining independence from French colonialism in the early 1950's was very short. By the late 1960s, Cambodia fell into a time of political instability, civil war and experienced the total destruction brought about from the Khmer Rouge era (1975-1979) where the formal education system was abolished and the majority of Cambodia's academics and intellectuals were either killed or fled the country. The attempt to rebuild and develop the country's education system as a key to reconstructing and developing Cambodia's socio-economic sectors during the 1980s was hindered by the lack of skilled human resources, and adequate finances. During this time and in terms of education reform, the curriculum was driven by socialist and communist ideologies.

In the early 1990s, Cambodia moved from a socialist planned economy towards democratic governance and a free market economy under the facilitation of the United Nations. The United Nations, however, did very little for educational reform, especially in terms of curriculum development and development of textbooks. What the United Nations did during this period was to remove socialist and communist ideologically oriented content and language from school textbooks (Ayres, 2000).

After the UNTAC supervised election in 1993, the Royal Government of Cambodia (RGC), in collaboration with various donors, developed and implemented a National Policy and Development Plan (NPDP) for Cambodia. Although this policy and plan also set the guidelines for education reform, it has been difficult to locate a succinct statement of the government's aims for Cambodia's formal education during this period especially as far as skill formation is concerned. The aim of the national education policy at that time was to promote literacy and numeracy, and provide basic knowledge in social studies and science.

In 1993 intentional efforts began at establishing specific student competencies and the development of curriculum and textbooks with a plan to introduce the new curriculum and textbooks by 1996. The first curriculum reform was achieved in the timeline that was scheduled. Walker (2002) argued, as far as his experience in developing the physics and mathematics curriculum in Cambodia was concerned, that at best the new textbook produced nothing at all, but at worst it produced teaching material that was substantially less helpful than the existing material. At this time, the textbook writing, editing and designing was under the responsibility of the Department of Curriculum Development, in the Ministry of Education, Youth and Sport, (MoEYS) where very few national staff had experience or knowledge of textbook and curriculum development (UNESCO, 2008). Furthermore, the curriculum and textbooks developed during this period did not address the two critical issues of technical and vocational skills, and life-long learning. Because of the urgency for reform, curriculum developers focused on emergency programs with limited scope for curriculum development (UNICEF, 1996).

The shift from project based support to a sector-wide approach in the late 1990's and early 2000's, coupled with a degree of political stability enabled the MoEYS to redefine its national education goals. The Cambodian system of education became aimed at developing fully the talents and capacities of all students in order that they become able people, with parallel and balanced intellectual, spiritual, mental and physical growth and development (MoEYS, 1999).

Arising from this overall goal, in 2005, the MoEYS developed a national curriculum for general education, including the upper secondary school, which was the basis for the redevelopment of the upper secondary school textbooks first used in 2010. The purpose of the Upper Secondary School (USS) curriculum according to the Curriculum Policy 2005 -2009 (2004) included the aims that students would develop:

- Advanced knowledge of Khmer literature and mathematics;
- Deep knowledge of the national identity;
- A more complex understanding of morality and civic responsibilities;
- The everyday life skills that enable participation in their local community life and Cambodian society;
- A broad understanding of the natural world and of scientific principles;
- High communicative competence in a foreign language (p.5).

In this sense, the upper secondary school curriculum was not only to expand and consolidate students' knowledge gained from their basic education studies (grades 1 – 9) but also to provide them with an opportunity for 'future orientation', that is, to specialize their studies, and to participate fully in the nation's social life (http://www.moeys.gov.kh/en/policies-and-strategies/73-policies/97-education-law.html).

The foci of the upper secondary school curriculum reform were determined to be:

1. National standardised component with the introduction of a tracking system where students are given the option to specialise in either natural science or social science. In this way, students may focus on a particular area of interest and deepen their knowledge through expanded lesson times and practice. Those who take a natural science major will choose advanced math and applied science related subjects (physics, chemistry, biology and earth and environmental studies), and those who elect to take a social science major will take basic math and social science related (moral/civics, history, geography, economics) subjects and spend more time studying these subjects in school.
2. Localisation of curriculum content through the introduction of local life skills and elective vocational subjects. (MoEYS, 2004, p. 12)

The concept of life skills, which was first introduced in the 1980s to address the AIDs epidemic, was expanded from the 1990's to an approach that was intended to be skills-based, and oriented towards behaviour change. The policy defined life skills as the 'intellectual, personal, interpersonal and vocational skills that enable informed decision-making, effective communication, and coping and self-management skills that contribute to a healthy and productive life' (MoEYS, 2004, p.8). Teaching this subject, to which a specified number of les-

son periods a week were allotted in grade 10 but which was not an assessable USS subject, was described as being one of the most important roles of schools.

Following this broad definition of Life Skills given by the MoEYS, it can be seen that in the grade 10 curriculum schedule (Table 4) between 25%-34% of teaching time was to be devoted to life skill education. The courses that sit under this definition include foreign languages, physical and health education, and Local Life Skill programs. In the grades 11 and 12 curriculum, 37.5%-62.5% of teaching time is devoted to life skill education; the courses include foreign language, economics, ICT/Technology, Tourism, Accounting/Business management, Art Education (and other subjects), and Local Vocational Technical Subjects (Table 5).

Table 4

Grade 10 subjects and time allocation (Source: MoEYS, 2004)

National Curriculum	**Hours per Week**
Khmer	6
Mathematics	6
Sciences	6
Social Studies	6
Foreign Languages	4
Physical and Health Education and Sport	2
Total National Curriculum	30
Local Life Skill Program (including Art education)	2-5
Total	32-35

Table 5

Grade 11 and Grade 12 subjects (Source: MoEYS, 2004)

Compulsory Subjects	**Hours Taught per Week**	
Khmer literature	6	
Physical and Health Education and Sport	2	
Foreign Languages (Must choose one)	English	4
	French	4
Mathematics (Must choose one)	Basic	4
	Advanced	8
Electives (each subject is taught 4 hours per week)		
Sciences (May choose none, one or two or three)	Physics	
	Chemistry	
	Biology	
	Earth and Environmental Studies	
Social Studies (May choose none, one or two or three)	Moral/Civics	

	History
	Geography
	Economics
Elective Vocational Education Program (May choose none, one or two or three)	ITC/Technology
	Accounting/Business management
	Local Vocational Technical Subjects
	Tourism
	Art Education (and other subjects)
Students who choose Math (Basic) must choose 4 subjects from the Electives Total 16 h + (4 x 4) = 32 hours per week Students who choose Math (Advanced) must choose 3 subjects from the Electives Total 20 h + (3 x 4) = 32 hours per week Students study the same subjects in both their grade 11 and 12	

One of the aims of the life skills program is to produce a pool of young people who are work-ready. This tacitly acknowledges that many students will not pursue further education, but directly enter the labour market at some point during their secondary school years.

It is important to note that while the national standardised component was an examinational subject, the Local Life Skills and elective courses were not. The national standardised component includes mathematics, Khmer, natural science, and social science. This fact is important in an education system where examinations are the sole determinant of an individual's academic progression from grade 12 into university.

The policy also recognises that not all students will enter the labour force immediately on completion of their secondary education. Therefore, in addition to aiming to produce students with a solid foundation in either the natural sciences or social sciences, clearly evident in the policy statements is a distinct expectation that the Cambodian formal education system (grades 1-12) would produce young people who were ready to pursue further education.

The following specific skills, attitudes and knowledge acquisition goals are selected from the policy document:

Students will:

- develop a love of learning that will enable them to pursue employment and continue life-long learning;
- have the knowledge, skills and attitudes necessary to improve and maintain their own physical and mental health and to contribute to the improvement and maintenance of the health of their families and wider society;

- have the capacity to manage and take responsibility for their own actions and decisions and be self-reliant;
- appreciate the value and importance of Science, Technology, Innovation and Creativity;
- have employment related skills, an understanding of and positive attitude towards work, and a capacity to manage and work effectively and harmoniously with others;
- have the capacity to exercise judgment and responsibility in matters of morality and a commitment to identifying, analyzing and working towards solutions of problems experienced by their families and society,
- have an understanding and appreciation of other people and other cultures, civilizations and histories that leads to the building of a public spirit characterized by equality and respect for others' rights.

  (MoEYS, 2004, pp.4-5).

The *processes* to be used in the schools to enable the curriculum to achieve these and the other aims were identified as:

1. Providing learning environments that will enable students to learn to know, learn to do, learn to be and learn to live together;
2. Equip students with the everyday Life Skills and Elective Vocational Education they will require to reach their full potential, and to be effective and productive members of society.
3. Emphasize active and applied learning in all subjects across the core curriculum, including the study of technology, which is the application of knowledge to improve the quality of life for all citizens.

   Policy for Curriculum Development, 2005 – 2009 (2004, p. 5)

Arising from this national policy was the development of and introduction of new subject textbooks for grades 1- 9 in 2007. In 2010 the new subject textbooks for upper secondary school were introduced. The Department of Curriculum Development in the MoEYS was responsible for the textbook development along with some authorship, but the textbook development was mainly reliant on foreign advisors.

However, most schools do not have the resources to be able to teach some specific subjects, mostly the ones in the Elective Vocational Education Programs (EVEP). Until recently, the subjects in EVEP (ICT, Accounting, Business Management, Local Vocational Technical Subjects, Tourism, and Art Education) remained untaught in a large majority of Cambodian high schools even though they have been placed in the official curriculum framework. Currently, work is being done on the development of textbooks for these subjects.

In 2011, a consultation meeting held by MoEYS where the 2005 – 2009 curriculum underwent review resulted in a decision to introduce further curriculum reforms. The new curriculum is being modelled on the 1960's Cambodian high school curriculum that required students to choose either natural science or social science. Whilst the reform was accepted in 2010, reforming the textbooks is still under discussion and they currently are not available for public review (Interview, October 10, 2013). The textbooks developed for the 2005 – 2009 curriculum reform are still in use. At the consultation workshop conducted for this study (September 23, 2013), a participant indicated that there was no current move to abandon the current textbooks despite the introduction of the new policy.

There has not been any study to date to assess whether the USS textbooks which were developed have been able to achieve the national curriculum policy objectives, specifically, whether high school graduates are being equipped with the two sets of skills: employability, and life-long learning skills. This study aims to begin to fill this gap through analysing the upper secondary textbooks and seeking insight into the experience of the revised curriculum from those that were its target, recent USS students.

II.5 Foundation Year Programs

The content of high school curriculum considered necessary to adequately prepare students for the workplace or tertiary study has been long and heatedly debated. With changes in the skills needed by an individual to successfully pursue further education and employment, many countries high school curricula have undergone reforms. Yet much existing literature consistently describes the disjuncture between high school learning and achievement and university achievement. The students who perform well in their studies at high school can struggle to survive once they are attending university. Their poor academic performance can force them to leave university early. In the United States, for example, a quarter of the students enrolling in their first year of university will have left their studies by the following ac-

ademic year due to their low academic performance resulting from irrelevant knowledge and inadequate skills for the tasks and requirements of university study (ACT, 2003).

II.5.1 Knowledge and skills for academic success

To be academically successful at university study, students need to engage in many different tasks and activities including advanced cognitive exercises and active participation in their course material (Reason, Terenzini & Doming, 2006). Advanced cognitive practices require that students are able "to analyze, synthesize, judge and apply information" (Reason, Terenzini & Domingo, 2006, p. 170) that they have received in their high school classroom and laboratories. In their high school studies, however, many students do not have many opportunities to develop and practice the higher levels of thinking. This then becomes an impediment when they enter tertiary level study. University study will usually require students to be actively involved in class activities and use those skills and attitudes needed to work independently and in small groups. These require effective time management skills, skills in information literacy, group work skills, and well developed academic reading and writing skills. High schools unable to equip their graduates with ample knowledge and skills high schools are considered by many to be "an educational wasteland" (Conley, 2001).

After many years of complaints that United States high schools were considered to have provided an inadequate level of preparation for university study, the Standards movement came into existence in 2002 (Haycock, 2010). At that time, four organizations worked to develop clear standards for the key learning areas in an attempt to close the gap between high school and university education. Unlike the Foundation Year Program in Cambodia with its focus on academic remediation at first year university level, the Standards Movement was trying to influence the high school curriculum to respond to the needs and requirements for a student's survival in university. A main driver for this reform was the large numbers of high school graduates who had completed high school course requirements with decent or even good grades but who could not perform well when they enrolled at university and consequently ended up in remedial classes or leaving university study. Many of these students came from groups that were traditionally underrepresented in university – students of black American and Spanish heritage.

Viewing the disconnection between the two educational levels as a major concern, some scholars (e.g. Allensworth, Nomi, Montgomery & Lee, 2009) claimed that providing common standards at high school was not an efficient measure to combat the issue. They ini-

tially proposed that a remedial program at university would help the students achieve better results. However, in their study of the impact of the university preparation courses at high school on later university achievement, they concluded that the lower ability students tended to struggle in preparatory classes, but any negative effects were just short-term. There were no long-term adverse effects. This does not suggest that low-skilled students cannot handle high school based university preparatory course work but rather that they do not benefit from it any more than they do from remedial course work at university. These findings also align somewhat with the recommendations by Reason, Terenzini and Doming (2006). They concluded that student's non-cognitive skills and behaviour need to be strengthened in high school and even in earlier grades, and that it was unreasonable that the policy makers place a heavy emphasis on greater cognitive demands when the students were still at high school or in lower grades.

Another policy developed to better aid students in their university study has been to create university preparation programs at university. There were a number of reasons why this option was cited as more practical. First, such programs are able to unify the students' experience and learning skills. Generally, students came to university with a wide array of demographic, personal and academic experiences and characteristics (Terenzini, Springer, Pascarella & Nora, 1995). Their attitudes towards university coursework varied greatly. High schools could not cope with this variation to produce a common standard for high school graduates with the large numbers of high schools throughout the country. Also, in some countries where decentralization has been exercised, for instance, the United States, each school district and state has enjoyed full autonomy in determining their curriculum, and methods of teaching and assessment and they are unwilling to give away power. With there being a smaller number of universities, it was considered easier for them to standardize their foundation year course than for the high schools to run good quality university preparation courses. Universities were also viewed as having considerable expertise in deciding what was relevant to the subject major each student was applying for. A second argument in support of a university based foundation year was, and is, based on an assumption that there was parity across the curriculum in terms of material covered by all universities. Congruent with this assumption was the expectation that completion of a foundation year at a university would make it possible for a student to transfer to another university or program of study if they decided to change their major or place of study.

Student retention has been an increasing focus in many countries as the pool of potential students undergoes a decline, undergoes a shift in demographics, or as a result of changing government policies whereby government funding to universities becomes linked to the numbers of students graduating rather than the numbers of students enrolling. The work of researchers like Tinto (1975, 1982, 1987) has provided important guidance to universities in developing their understanding that a student's decision to continue their university study is influenced by a myriad of factors and that many of those factors, for example, working in small groups, are under the control of the university and academic staff. Universities have, for example, created mentor and orientation programs in their attempts to reduce student attrition. In addition, first year teaching staffs have also received training and support in using approaches to teaching and learning that create supportive learning environments. The development of university Academic Learning Support Centres, the provision of library skills orientation programs, and study skill programs designed specifically for first year students are further outcomes of the extensive and active research into the experiences and needs of first year students.

Increasing recognition of the diversity of the students entering university, for example students from minority ethnic groups, international students, and non-traditional (mature) age students has resulted in universities also recognizing their role in better equipping students for their study. The First Year Experience (FYE) is an extensively researched topic and numerous initiatives have been developed by universities around the developed world in attempts to not only attract students to their campus but also to retain them. In light of the richness of material available on the first year experience of university study and the numerous initiatives developed by universities there is much that can applied to the Cambodian HEI FYE context, a context which until now has not been well researched.

II.5.2 Cambodian university Foundation Year course

The Cambodian higher education landscape was transformed dramatically after the government's introduction in 1997 of public- private partnerships. The numbers of higher education institutions exploded, increasing from less than 10 before 1997 to 97 in 2011. During that time; the numbers of students mushroomed from less than 10 000 to more than 200 000 (Mak, 2012). A growing concern is appearing in the literature about Cambodia's higher education system and this focuses on the poor quality of learning being offered in many universities associated with rapid expansion and loose monitoring.

To ensure that students at university will graduate with a well-developed foundational knowledge and be able to transfer across institutions with recognised transferrable credit, a compulsory Foundation Year Course (FYC) was introduced to Cambodian universities six years ago. The Foundation Year Course is mandatory in all higher education institutions in Cambodia. The aims of the Foundation Year were to both broaden and strengthen students' knowledge in preparation for tertiary education. The Foundation Year Course was developed in 2004 and it was first implemented nationally in the 2005/2006 academic year.

The introduction of a compulsory foundation year was based on a recommendation made by the World Bank team that students in Least Developing Countries (LDC) needed to delay subject specialization and complete their tertiary education from a strong basis in the arts, humanities and mathematics, natural sciences, and social sciences and foreign languages (Innes-Brown, 2006). Given the disparity between experiences of the Cambodian rural and urban students of educational provision, Innes-Brown (2006) also argued that the Foundation Year Course aimed to provide the pre-requisite knowledge needed for subjects taught in university and that 'the Foundation Year Course aims to level the playing field between students from the provinces and Phnom Penh' (p.30).

Following this recommendation, the original Preah Reach Kret on accreditation set a minimum standard determining that the university Foundation Year Course should comprise of four main subject areas: arts and humanities, mathematics, applied science and computing, social science and foreign language. It was decided that each subject area must have 20% of the total credit and another 20% was to be for the subject/s that related to a student's chosen major.

Entry into Cambodian higher education is dependent upon successful completion of the senior school certificate at the end of grade 12. Entry into higher education is therefore merit based so, in principle, the ability to participate in the Foundation Year Course should be a reflection of a student's capability. With the upper secondary school curriculum revision and subsequent introduction of new textbooks in 2010, it would clearly be beneficial for students and teaching staff if the curriculum between upper secondary school and first year university was seamless and sequential in developing the learner's knowledge and skills.

Development of the Foundation Year curriculum is the responsibility of individual Higher Education Institutions (HEIs). In an attempt to ensure some degree of quality control across Cambodia's HEI's, the Accreditation Committee of Cambodia (ACC) was created. All

HEIs are required to submit their Foundation Year Course curriculum to the ACC for approval. Although the ACC has set a minimum standard, many Cambodian HEIs have been unable to meet this and have requested the ACC to make the standards easier (Innes- Brown, 2006).

An analysis of the criteria used by the ACC for accrediting Foundation Year Courses found that it 'focuses heavily on structural parameters (i.e. length of course, subject inclusion, content covered) rather than values associated with the effectiveness of teaching and learning' (Innes-Brown, 2006, p.15). Absent from the accrediting criteria, for example, was any attempt to determine the quality of the textbooks and other teaching and learning resources used by the HEIs for teaching their first year courses.

Many of Cambodia's HEIs, particularly the newer and smaller ones have designed their curriculum and related textbooks using staff with little or no curriculum development experience. Few HEIs have staff with the education, skills, or experience to design programs and curricula meeting priority national needs, including curriculum adapted to the background from which students come. The problem of poor curriculum design is compounded by the lack of texts in Khmer, a result of Cambodia's unique recent history. Indeed Cambodia's higher education development experience has been directed by foreigners as is evident in the successive use of an exceptionally diverse range of foreign languages (e.g. French, Russian and English) for the HE instruction and textbooks over the last 60 years.

The current university curriculum and textbooks are mainly translations from foreign language texts, especially English and French, but increasingly from other language sources, including Japanese, Korean and Thai. However, the vast majority of faculty members lack sufficient competence in a foreign language to make effective use of libraries and/or the internet to make effective use of the global knowledge database relevant to the discipline being taught (MoEYS, 2008). As a result, university Foundation Year curriculum and textbooks are frequently copied from other institutions or the internet with little adaptation to the needs of Cambodian institutions, their students and their unique environments (MoEYS, 2008). This is compounded by the fact that many lecturers teach the same courses for several universities therefore the same material is being used at several different institutions.

Until now, it has been unknown whether there are links between upper secondary school textbooks and foundation year textbooks and if they do in fact allow students to progress and develop as learners in specific subject or key learning areas, or whether they offer mainly repetition of material covered in high school. This study will explore the degree

(amount) of overlap and extension between the USS revised curriculum as evidenced in the textbooks and the Foundation Year curriculum as uncovered in the textbooks.

Chapter III: Research Methodology

III.1 Timeframe of the Study and Population

In this tracer study the population surveyed was a sample of young people who had studied in secondary school since the academic years 2009-2010. However, grade 12 students in 2009-2010 were not included due to the policy changes being implemented only in their final year at school. Students who were enrolled in a university foundation year program in 2011/12 were also included in this study. The reason for including this cohort was because these were the first two secondary school cohorts who have studied using the new textbooks introduced in 2010 which were based on the 2005 policy on curriculum development.

III.2 Sample and Recruitment

The initial pen and paper survey was conducted with young people who were either foundation year students or those who had completed grade 12 and left school seeking employment. This group has been called the Employed group. Data collection was conducted using trained groups of research assistants who worked in nominated locations. Snowballing, an approach useful for locating information-rich key informants in settings where subjects may be difficult to locate was the process used to identify individuals from these target groups for the survey. The Employed group were the most challenging sample to identify due to the diversity of destinations whether employed, underemployed or unemployed. The research assistants spent time in the nominated village or town centres speaking to young people and at venues where they were most likely to congregate and inviting them to invite others they knew of to participate. They distributed an explanation leaflet describing the research project and explaining the purpose of the survey.

Foundation year students at universities were recruited after making an initial approach to the teaching staff in the selected university's First Year course office seeking researcher access to the cohort for survey participation.

Phone interview participants were self-nominated by completing a separate nomination slip distributed with the survey but separate to the survey. The nomination slip also explained the purpose of the interviews and asked those willing to participate in an interview to provide their name and a contact number.

The sample was differentiated according to the region in which the subject lived when they were studying at upper secondary school. The five regions[6] (see Table 6) and the population and sample sizes (for 95% confidence with a confidence interval of 4) for the surveys are in the following table.

Table 6

Regions and sample size for survey data collection

Total population 960 922 (EMIS 2009-2010, 2010-11, 2011-12)					
Sample as % of total population (for 95% confidence with a confidence interval of 4)[7]			**Sample Size (Planned) (n= 600)**	**Actual Sample**	
				F[(1)]	**E[(1)]**
Phnom Penh Region	Phnom Penh	17% of 145,450	102	56	67
Plains Region	Kompong Cham Kandal Prey Veng Svay Rieng Takeo	23% of 372,478	140	65	88
Tonle Sap Region	Banteay Meanchey Battambang Kompong Thom Siem Reap Kompong Chhnang Pursat	38% of 276,187	226	132	170
Coastal Region	Kampot Sihanouk Ville Kep Koh Kong	10% of 76,231	60	49	46
Plateau/Mountain Region	Kompong Speu Kratie Mondul Kiri Odar Meanchey Pailin Preah Vihear Ratanak Kiri Stung Treng	12% of 90,486	75	36	50
Total Sample Size			600	338	421
				759	

(1) F= Foundation Year Student, E= Employed School Leaver

6 Adopted from the Poverty Report 2004.

7 For the details on the calculation method please see:
http://www.surveysystem.com/sscalc.htm

III.3 Data Collection Tools

Pen and paper surveys

The initial data was collected through the use of pen and paper surveys. Khmer language was used in all data collection tools. The questions were initially developed in English, translated into Khmer and then back translated to check for accuracy of translation. Simultaneously, textbooks and teacher manuals for each senior secondary school subject and several course textbooks from five universities Foundation Year courses were analysed for the extent of overlap and extension.

Limitations to the use of pen and paper surveys include the assumption of a level of literacy and competency in Khmer language. Whilst literacy skills were unlikely to be an issue for those pursuing university study it may have been a limitation for some in the employed group and is acknowledged as such.

The pen and paper survey was designed, in part, to measure the perceptions of the relevance of the textbook material to either their Foundation Year studies or the workplace of former students. Measuring perceptions can be an inaccurate albeit useful process because it relies on the participants' memory of experiences. In this case, participants were being asked to recall textbook material studied up to 4 years ago and to make a judgement on its relevance and usefulness for their current situation. With very limited experience and understanding of what constitutes an effective textbook as well as the dimming effects of time on memory, their responses need to be considered impressionistic rather than necessarily academically informed. The learning theory of conscious competence (Robinson, 1967) offers a helpful explanation for this study when discussing the analysis of the responses to the survey questions regarding textbook usefulness. The participants in the survey were unconscious of what they did not know; they were, in effect, unconsciously incompetent. Basing perception on only their own limited experience means that their responses are shaped by their own individual experiences that have not necessarily been subject to informed analysis or reflection.

Textbook analysis

Originally, this study had planned to analyse the Foundation Year textbooks from 9 universities, but during the course of this study only some subject foundation year textbooks from 5 universities were made available. These five universities will be identified according to location - Phnom Penh based or regional, - and whether private or public.

The analysis of the content of USS subject textbooks and subject teacher manuals was conducted by subject specialists in order to determine the degree of alignment between the policy and the materials with which the teachers and students worked. Likewise, the content analysis of the Foundation Year textbooks was conducted to identify where there was overlap between the revised USS curricula and where there was extension of the USS curriculum content.

Structured telephone interviews

The original plan had been to conduct a number of audio-recorded focus group discussions using a semi-structured approach. In the course of the project, the research team changed the plan and conducted follow-up phone interviews with 40 of those who had participated in the survey. The 40 participants were randomly selected from the list of names and phone contacts provided to the researchers during the first-phase of the data collection from nine different provinces throughout the country. Fifteen female and 25 male students were included in this second-phase of the study. Eighteen were foundation year students, and another 18 were second year students at the time of interviews. The remaining four in the sample were in year three of their bachelor courses.

III.4 Data Analysis Method

With this study designed as a qualitative descriptive study, the completed survey data was first entered into a spread -sheet and analysed to generate descriptive statistics. Some analysis using the SPSS program was also conducted. The phone interviews were transcribed, translated into English, and analysed for emerging themes and patterns.

The text books and teacher manuals for the senior secondary school subjects were analysed for degrees of alignment between the stated curriculum policy aims and the subject content and teaching/learning processes as identified in the documents. The curriculum material from 5 university Foundation Year courses were analysed and the degree and type of content overlap identified as well as the amount of content extension. These analyses were conducted by several academic staff working in the university sector and all of whom were also involved at university level in teaching in the subject areas of the textbooks they reviewed.

III.5 Consultation Process

A national consultative workshop was held with participants from the Department of Curriculum Development, the Department of Secondary Education, a senior leader at the

Ministry of Education, Youth and Sport, the Department of Standards, the ACC, an education specialist from the donor agency, and a subject specialist leader from all subjects in the upper secondary education from one upper secondary school. The participants were invited to provide input on the initial draft report of the field data analysis as well as input for discussion of the research questions.

Chapter IV: Results and Analysis

IV.1 Result and Analysis - Survey Data

This component of the study was conducted through the use of a researcher-developed pen and paper survey of 759 young people from across Cambodia. In this report the two groups are identified as either Foundation Year students or Employed group. 'Employed group' is the term adopted to describe young people not studying at university at the time of the data collection and who may be employed, self-employed, or underemployed.

Part A below presents an account of the survey results where both groups were surveyed jointly, while Part B presents results specific to each group, separately.

IV.1.1 Part A — Conjoint survey of both groups (Employed and Foundation Students)

Participant background

Gender, age, and place of birth

The Foundation Year student sample ($n = 338$) consisted of slightly more male respondents (51%) than female whereas in the Employed group sample ($n = 421$) 51% were female. In both groups the largest age representation was in the 19-23 years age grouping which accounted for 75% of the Employed group and 86% of the Foundation Year samples. Table 7 below displays the demographic information of the surveyed samples.

Table 7

Demographic profile of surveyed sample

Classification	Groups	
	Employed (n=421)	**Foundation Year (n=338)**
Gender		
Female	51%	49%
Male	49%	51%
Age		
1980-1984	1%	1%
1985-1989	9%	5%
1990-1994	75%	86%
1995-1999	15%	8%
Unknown	1%	1%
Place of Birth		
Phnom Penh	6%	7%
Plains Region	34%	33%
Tonle Sap Region	38%	35%
Coastal Region	10%	12%
Plateau/Mountain Region	11%	13%
Unknown	1%	0%

High school education background

Slightly more Employed group respondents (98%) reported attending a public high school than Foundation Year students (93%) and a majority of both groups attended high school in a town or city.

Whilst all Foundation Year students had attempted and passed the grade 12 national examination, slightly more than two thirds (69%) of those within the Employed group reported completing grade 12 (13% reported only completing grade 10). Of those Employed who reported they had completed grade 12 ($n = 290$), 253 of them attempted the national examination and 79% ($n = 230$) of those who attempted the examination passed.

Parent education and occupation

In general, the level of formal education for parents of the Foundation Year group was higher than the parents in the Employed sample. The highest levels of formal education for both groups of parents are reported in Table 8. Whilst we see that a majority of the mothers in both samples had completed school to primary level, the level of education for the majority of fathers of Foundation Year students was at the lower secondary level compared to the majority of fathers of the Employed group reaching primary school level. In the Foundation Year sample, the percentages of fathers and mothers with a tertiary level education were more than double those of the parents of former students in the Employed sample. Substantially more parents of the Employed group had no formal education compared to the parents of Foundation Year students.

Table 8

Parent - highest level of education

		Highest Level of Education Attained					
		No Schooling	Primary	Lower Secondary	Upper Secondary	Tertiary	No Response
Mother	Foundation Year	6%	39%	32%	17%	4%	2%
	Employed	19%	49%	21%	9%	1%	1%
Father	Foundation Year	5%	26%	34%	26%	7%	2%
	Employed	17%	37%	25%	17%	3%	1%

One clear distinction between the two groups of parents was the number of fathers who were own account (self-employed) workers; there were considerably more fathers of this

group in the Employed sample than in the Foundation Year group of fathers. Noticeably more mothers and fathers of the Foundation Year students were working as paid employees (See Table 9). It is interesting to note that some fathers were reported to be an employer by respondents in both groups, albeit in very small numbers.

Table 9

Parent: occupation type

		Types of Occupation					
		Employer	**Paid Employee**	**Self-employed**	**Unpaid family worker**	**Other**	**No Response**
Mother	Foundation Year	0%	8%	61%	26%	4%	0%
	Employed	0%	4%	64%	25%	5%	2%
Father	Foundation Year	1.5%	28%	61%	0%	0%	9%
	Employed	0.2%	18%	67%	0%	13%	1%

High school subject major, and reasons for choice

The Natural Sciences was selected as the high school subject major by the majority of both Foundation Year students (77%) and the Employed group (55%).

The reasons given for the choice of high school subject major by the Foundation Year students were diverse and more than one reason was offered by many respondents. The two most frequently cited reasons for subject major choice was the belief that the subjects in that major were aligned to their career aspirations followed by a belief that the subjects in the selected major were easy to study. No respondents reported choosing their subject major because they enjoyed the subjects.

Among the Employed group the most frequently cited reason for subject major choice was the belief that the subjects in that major were easy to study followed by the view that the major was aligned to their career aspirations. Few (2%) reported choosing their subject major because they enjoyed the subjects whilst having no choice of subject major at their high school was reported in 2% of responses.

Sources of advice

More Foundation Year students (86%) reported consulting someone about their choice of high school subject major than in the Employed group (63%). Those who were consulted by the Foundation Year students and Employed group can be seen in Figure 9.

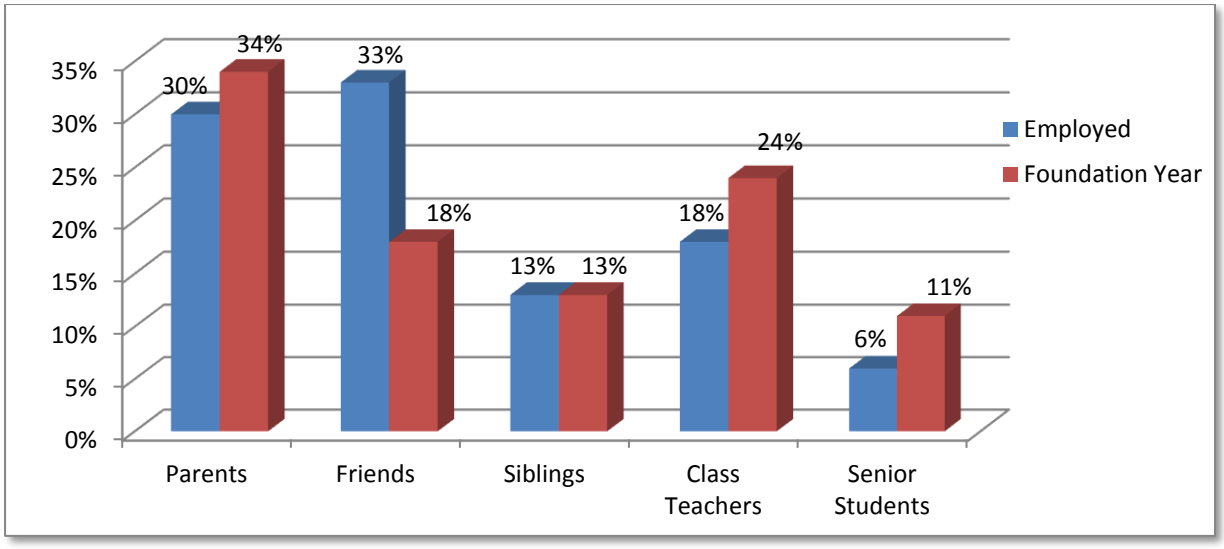


Figure 9. People consulted when choosing subject major — Comparison between groups.

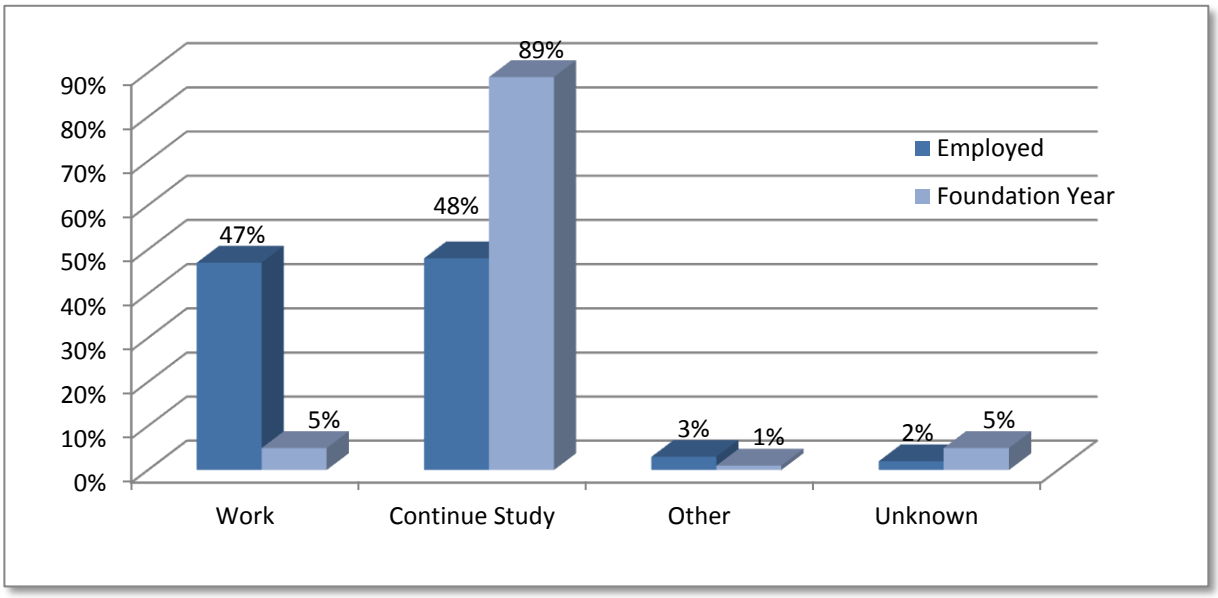


Figure 10. Post-high school aspirations- Comparison between two groups.

Further education versus employment

The post-high school aspirations of both groups are illustrated in Figure 10 where the majority in both groups wanted to continue study however twice as many Foundation Year students aspired to further study than the Employed school leavers.

Of those in the Employed group who wanted to work after leaving high school, ($n = 197$) the majority (45%) wanted to find work in the private sector. Of those in the Foundation Year group wanting to work after school ($n = 17$), the majority wanted to work in the national government (41%).

Continuing versus discontinuing study

Reasons for not continuing with their study after high school for the Employed sample were varied and the most frequently mentioned reasons can be seen in Figure 11. A lack of parental support and the family having insufficient resources were the most frequently identified reasons.

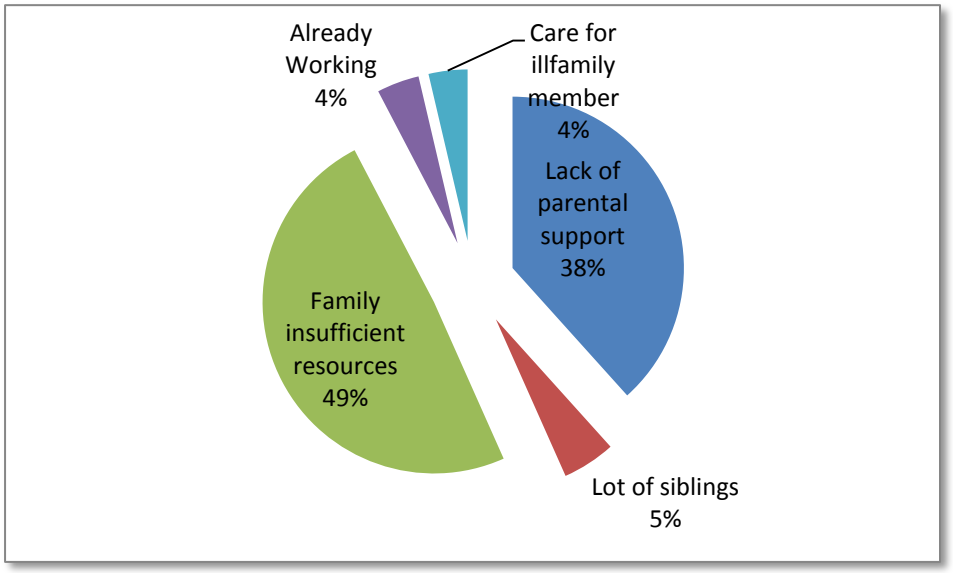


Figure 11. Reasons for not continuing study after High School – Employed.

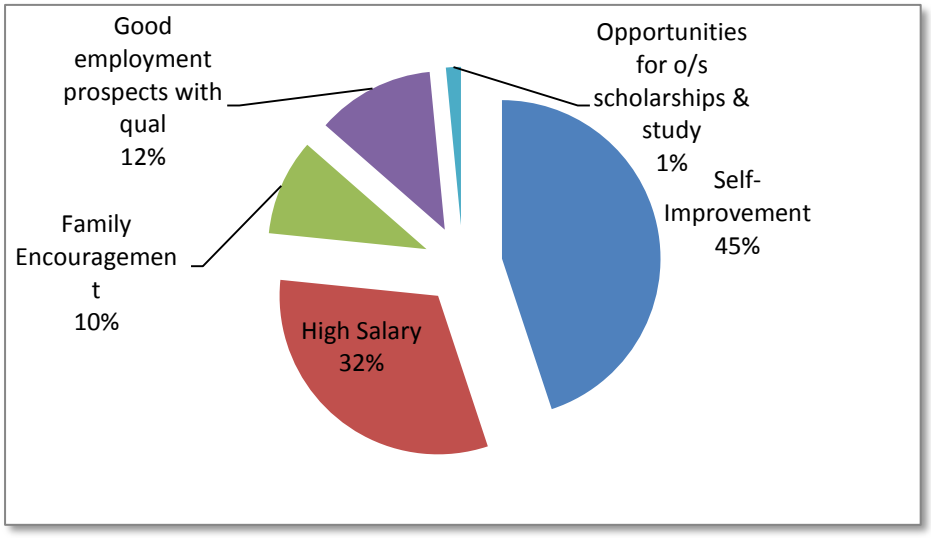


Figure 12. Reasons for pursuing study post High School — by Frequency.

Among the Foundation Year students, the reasons for continuing with their study after high school included seeing university study as a means for their own personal growth and development, being able to earn a high salary, and a degree was seen as providing the key to ensuring many career opportunities were available (Figure 12).

IV.1.2 Part B — Group-specific questions

This section reports on the responses of the two groups to the survey questions that were specific their category –either Employed or Foundation Year students.

Employed Sample

Occupation and income

Of the employed respondents, 56% reported that they were employed in the private sector in other than their own family's business, while 29% reported that they worked in their family's business, 10% were self-employed and 1% worked in the public sector. The majority (67%) of those employed worked greater than 40 hours a week, and 42% received a monthly income of $80 - $150 followed by 36% earning less than $80 per month.

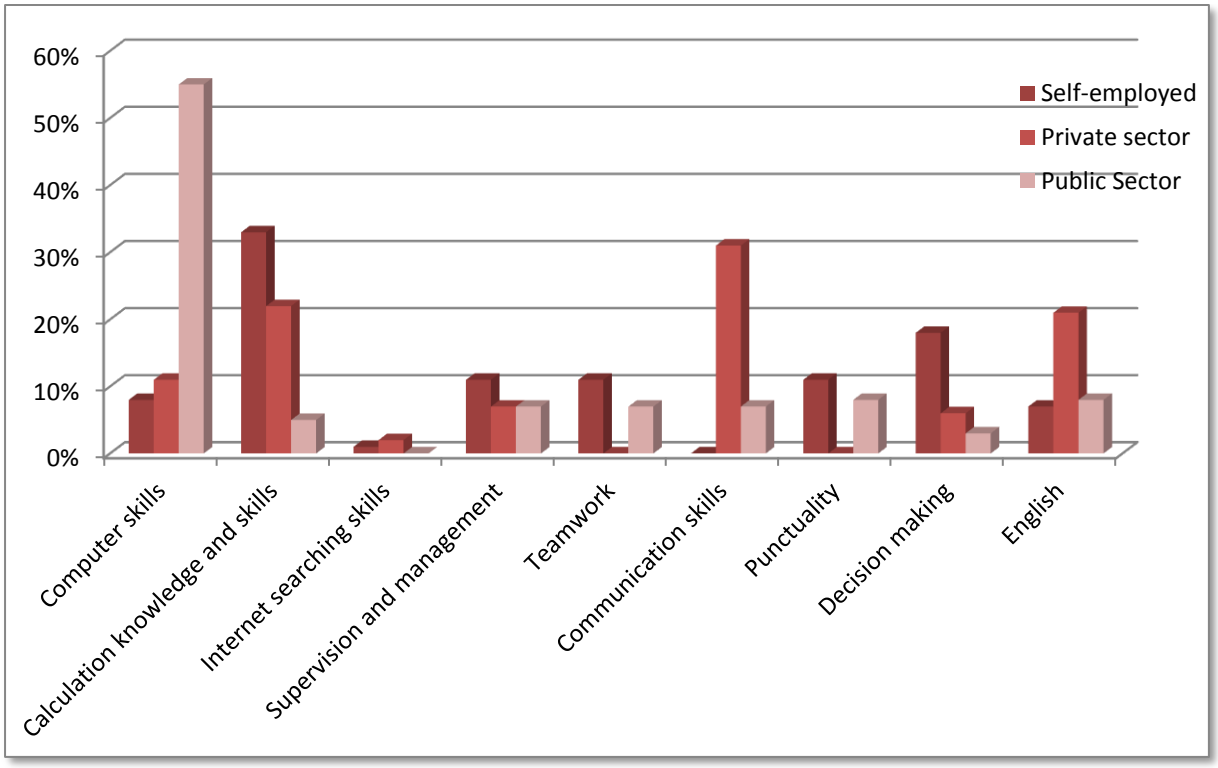


Figure 13. Needed skills by sector as identified by respondents.

Skills for new employees

The survey asked former students who were new employees their views on the skills they believed were needed by people commencing work for the first time. The types of skills and the frequency with which they were mentioned for each of the three categories of employment can be seen in Figure 13. For those who were self-employed and working in a family businesses, the skills needed to perform the work well were reported to be calculation, de-

cision making, supervision and management, team work and punctuality. For those who worked in the private sector, skill in communication was reported most frequently, followed by calculation, English language and computer skills. And for those who worked with the government or a local authority, computer skills, English language proficiency, and punctuality were reported most frequently.

Value of school for the world of work

On a five point scale from Poor to Excellent the Employed respondents rated their experience of school in terms of how well they thought it had *prepared them to look for work*, see Figure 14.

Figure 14. How well high school prepared students to look for work.

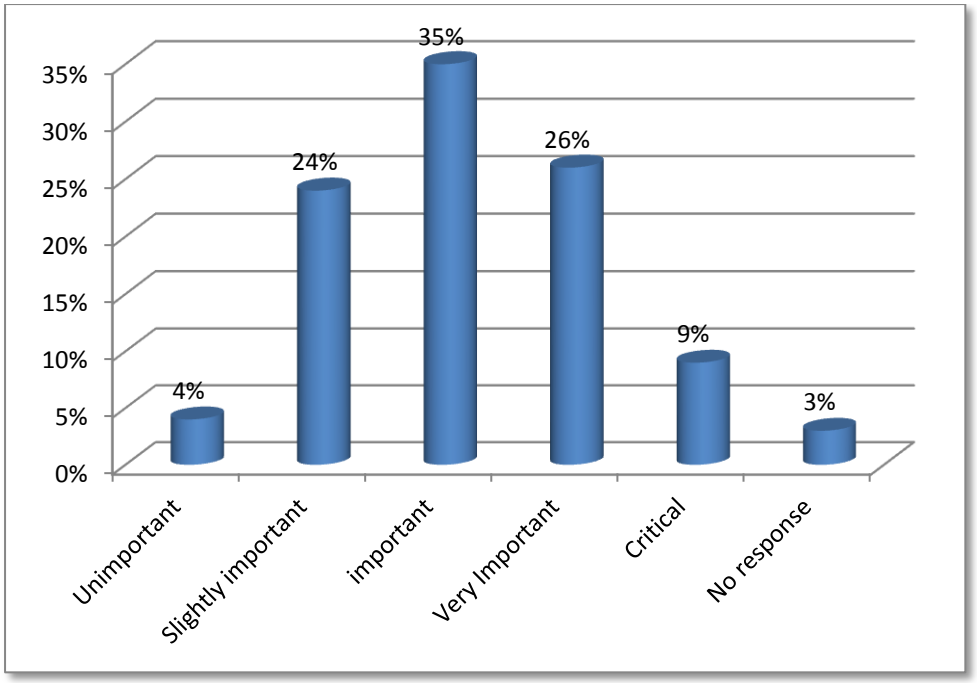


Figure 15. Equipped for current work after school – Importance of high school.

A second question asked of those who had left school and who were not in a foundation year of study concerned their perceptions of the importance of their schooling in equipping them for their *present* work. (See Figure 15)

The four most frequently cited subjects that the Employed group believed had prepared them well for their current work were mathematics, Khmer literature, moral study, and English. The three most frequently cited subjects or topic areas identified as needing further focus in high school studies to better prepare young people for the world of work were foreign languages, computer and internet skills, and mathematics.

Foundation Year Students

Multiple university enrolments

A small number (18%) of the students reported that they were enrolled in more than one university or major. The most frequently stated reason for more than one enrolment was the belief that having multiple skills would make them more employable because they will have a diversity of skills.

Employment

Whilst most Foundation Year students reported that they did not work, nearly one quarter (22%) of the sample were engaged in part time employment and whilst the majority

of this group were working less than 40 hours a week, a large percentage (43%) of those employed reported working 40 or more hours per week. The two most frequent reasons for working included wanting the work experience, and needing the money to pay for study and study related costs.

Semester study load

Most students reported studying between 1- 6 subjects in their first and second semesters (77% and 47% respectively), and whilst most reported that the easiest individual subjects were in the area of humanities and the arts, this overall area was also identified as one of the hardest areas.

New knowledge or repetition

The present study investigated whether or not students thought that there was content overlap between their high school grades 11 and 12 subjects, and the subjects studied in their Foundation Year. Most students (89%) reported learning new knowledge and the most frequently identified subjects for new knowledge acquisition were in the social sciences closely followed by the natural sciences. In response to a direct question about possible overlap between Foundation Year subjects and subjects studied in high school, 52% disagreed that such an overlap occurred. Two upper secondary school subjects most frequently identified as having the same content as Foundation Year subjects were History and Khmer Culture.

Preparation for university study

Using a 5 point Likert type scale, respondents were asked to indicate how well they felt specific skills and knowledge learned at high school had prepared them for their university study. Figure 16 summarises the frequency of ratings given for each of the 7 areas listed in the question.

Experience of teaching

The Foundation year students provided insight into their experiences of university teaching and learning compared to teaching experienced when at high school and 91% reported university teaching to be different to that experienced at high school. The three most frequently identified differences between their experience of high school teaching and university teaching was the lack of opportunity at high school for independent or co-operative learning, inadequate resources at school, and poor pedagogy.

The four most frequently identified areas the Foundation Year students proposed be provided in their first year of university studies were computer use, skills in research, skills in English language, and more opportunities for practical experience.

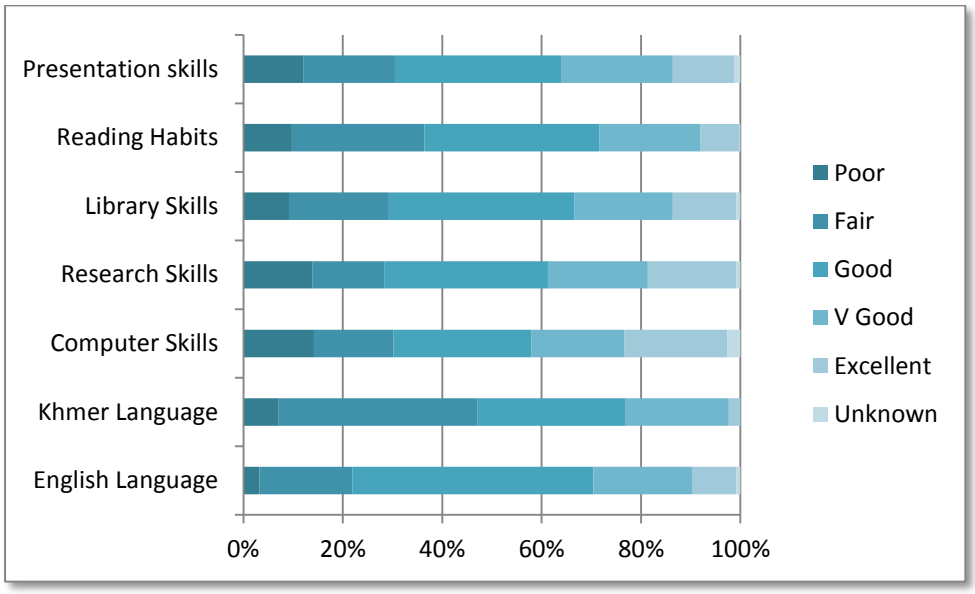


Figure 16. Adequacy of skills learned at high school for university study.

IV.2 Results and Analysis - Telephone Interviews

The following are the findings from a researcher-developed interview schedule of recorded telephone interviews conducted with 40 foundation year participants randomly selected from the first-phase sample from nine different provinces throughout the country. Fifteen female and 25 male students were included in this second-phase of the study. Eighteen of them were foundation year students, and another 18 were second year students at the time of interview, the remaining four in the sample were in the third year of their bachelor courses.

The mean number of the subjects studied in both semesters of foundation year reported by respondents showed that students were usually required to study more subjects in the first semester (*M=5.7*) than in the second semester (*M=5.0*). The most common subjects universities required their students to take were Khmer, Mathematics, English and Computer. Other subjects varied according to the majors they had selected.

Reasons for Changing Subject Major

Half of the sampled students had selected social science as their major when they were in high school, almost another half (18 students) had opted for natural science. Two stu-

dents completed their high school study before 2010, the year before subject major selection at high school was first introduced and were therefore deleted from this sample.

Of the 38 students, 25 of them (65.8%) pursued their high school selected majors at university, while the remainder changed their university major. Nine students who had initially selected natural science (23.7%) changed their university major to social science, whereas four students changed from social science to natural science. The main reasons given for changing were their own personal preference, and their perception of future employment opportunities. A second year interviewee from a regional university stated, "*I changed my major because I want to study accounting, and this field has a wide array of job opportunities, since there are so many micro-finance centers in the province which are in dire need of accountants.*" Similarly, another second year interviewee at another regional university was very optimistic about his change of subject major. He said, "*When I graduate from university, I can run my own business if I have enough money because I have learnt a lot about business management by that time.*" Some participants who reported that they had changed their majors did so because the formerly selected major was too difficult for them, or they had obtained a scholarship from their university to study a different major.

Table 10

Reasons for changing their major ($n = 13$)

	Frequency ($n = 18$)	Percentage (%)
Employment opportunity	6	33.3
Personal preference	6	33.3
High level of difficulty of the previously selected major	3	16.7
Not aware that his/her selected major is a social or natural science	2	11.1
Obtaining scholarship	1	5.6

Before students changed their major, their plans were usually raised for discussion with their family members, including parents and siblings, and their friends. Among those who changed their major, three stated that the study at university remained *easy* for them, while four of them said it was quite *hard.* The other two students believed that they could survive their academic study even though it was a bit hard. They also explained that it was hard for them because they had been academically poor since they were in high school. For

others their study in a changed major was easy because of (1) hard work, and (2) strong motivation in learning. A regional university interviewee said

> *Study is like performing other jobs. If you are motivated, you will work hard for it. Then everything seems so easy for you. I have my own business plan, and this plan is encouraging me to work hard on my study to learn and gain all necessary skills to realize my business dream.*

High School Curriculum and Student Readiness

Thirty-nine participants answered the question *"How well do you think your high school prepared you for your further education at university?"* One student preferred not to respond to it. Of all interviewees, 26 of them (65%) stated that the high school curriculum prepared them *reasonably well* for their studies at university, while 11 respondents (27.5%) reported feeling their high school had prepared them *perfectly well* for study at university. Two students claimed that their high school learning experience and knowledge had *not prepared them well* for university.

According to the two students who had reported poor high school preparation for their university education, their responses were based on their perception of a disconnection between high school curriculum and the foundation year curriculum. Some subjects were completely new to them, which made it difficult for them to follow instruction in class and, as a result, low academic performance was reported. For instance, a regional female foundation year interviewee said,

> *Subjects at high school should be somewhat closely related to subjects at university. The high school and its teachers need to clearly inform and advise students on how and why to choose social science over natural science or vice versa. And then the subjects needed to prepare for such a selection should also be informed to their students.*

Eleven respondents were strongly positive in believing that their high school had prepared them perfectly for their university studies. They all cited a similar reason – that there was a clear link between their high school study and their university studies. They were confident that the general knowledge or 'hard skills' from high school had helped them in their university lives. A regional university student claimed that 80% of the subjects he had studied in high school, for example, mathematics, statistics, and Khmer were relevant to his university major, which enabled him to survive in his major with ease.

Changes to High School

When asked to provide suggestions about improvements to their high school that they believed would better assist students prepare for academic success at university, the 26 interviewees who thought that their high school curriculum had prepared them *reasonably well* for university identified various aspects that they believed needed to be changed (See Table 9). The majority of the students expressed a desire to have relevant subjects at high school so that they would not have problems pursuing further education. They also suggested that schools strengthen their behaviour management practices, and emphasize English language learning more because the majority of universities in Cambodia used English as a medium of instruction and/or in their textbooks.

When talking about behaviour management they raised several topics. They expressed a belief that teachers needed to pay more attention to student attendance and uniforms. The interviewees also expressed the view that teachers should force the students to work harder but still maintain a good relationship with other teachers and students. The interviewees expressed the opinion that cheating during examinations should not be permitted under any circumstance and corruption should be reduced to the minimum, so that good students are motivated to work hard. Five students suggested that their teachers should care more about their teaching. Some students criticized their teachers for their poor quality of teaching. A regional male university student reported that, "*My teachers at high school should pay more attention to teaching, have less absence, and provide clearer explanation.*"

Some interviewees wanted their schools to have more learning hours, and to promote research work and group work. In regards to more learning hours, students explained that having more learning contact hours would help them gain greater knowledge and ultimately improve the quality of their university studies. Students also deemed that more exposure to research skills and teamwork was necessary if they were to perform well at university level. Very few students wanted their schools to hand out more learning materials and many wanted their high school to be able to clearly advise them on what subjects they needed to select at high school.

Table 11

What to add to the high school curriculum ($n = 26$)

High school curriculum should…	Frequency ($n = 37$)	Percentage (%)
Put relevant subjects into high school curriculum	8	21.6
Strengthen school disciplines (attendance, uniform, respects, etc.)	6	16.2
Proper English training	6	16.2
Teachers should pay much more attention to their teaching	5	13.5
Increase more learning hours	4	10.8
Encourage students to research work and group work	3	8.1
Improve the quality of education	2	5.4
Provide more general knowledge	1	2.7
Provide more learning-supporting materials	1	2.7
Inform students of the relevant subjects for their university majors	1	2.7

Differences between High School and University Curricula

The results from the phone interviews found that most of the participants (87.5%) believed that there were some similarities and also differences between the content of the material studied at high school and the Foundation Year curriculum. No participants reported the material studied was completely the same, four interviewees (10%) stated experiencing a radical difference. One participant declined to answer this question.

When the responses from the interviewees were categorized into themes of Different and Same the subjects that were identified as being largely the same were Math, Khmer, and History. As can be seen from the following table (Table 12), the first and most influential difference (which accounted for 49% of all the reasons mentioned in the phone interviews) was that some subjects in Foundation Year were not available in high school. Those subjects included economics, finance, computing, and psychology, to name just a few. The respondents then highlighted that university, unlike high school, provided them with the subjects dealing with the skills needed for jobs, while at high school most of the subjects dealt with general knowledge only. Like many other interviewees, a regional university student stated that, "*In high school, they focus on general knowledge and morality to be a good citizen… At university, specific skills and research work are mainly targeted.*"

Table 12

Differences between High School and Foundation-Year curricula

Unlike high school, university…	Frequency ($n = 47$)	Percentage (%)
Has some completely brand-new subjects	23	48.9
Puts main foci on skills building	5	10.6
Promotes teamwork and critical thinking	4	8.5
Focuses on practice, research and lab work	4	8.5
Has concise but detailed lessons	4	8.5
Uses English as a medium of instruction	3	6.4
Is equipped with more modern teaching and learning facilities	3	6.4
Hires some foreign teachers and professors	1	2.1

Experience of Learning

The interviewees explained that their learning experiences at high school were completely different from that at university. Four of them claimed that at university, the curriculum promoted (1) teamwork and critical thinking skills; (2) hands-on practice, research and laboratory work; and (3) concise but detailed lessons. According to them, in high school it was necessary for them to memorize long useless lessons in order to pass the grade level exams or tests, and as a result the interviewees reported experiencing learning-environment shocks after starting at university, where they found they were required to carry out research, laboratory work and/or group assignments in an independent, critically thinking manner.

Some interviewees reported that at university, teachers used English for their method of instruction (3 responses) and utilized modern teaching facilities, such as LCD's, over-head projectors, or computer laboratories to aid and support their instruction (3 responses). Back in high school, their teachers utilized whiteboards heavily, for they were the only available teaching resource. One interviewee made the observation that his first experience of a foreign teacher was at university.

IV.3 Results and Analysis - High School Textbook Analysis

Objectives of the Cambodian High School Textbook

The overarching policy objectives of Cambodia's formal (grades 1- 12) education system is described as being the production of learners who have the skills and attitudes, "to learn to know, learn to do, learn to be and learn to live together," "everyday life skills," "high

level of knowledge and skills," and that schools and classrooms will "emphasize active and applied learning" (MoEYS, 2004, pp. 4, 5).

The following analysis describes the type of subject content and levels of critical thinking being covered in the high school textbooks. The analysis was conducted by university academic staff within their specialized subject areas. Textbooks and teacher guidebooks were analysed for subject content for Grades 10, 11, and 12, the senior years of schooling in Cambodia.

The results have been organized under the framework of three major learning areas: Knowledge, Skills, and Attitudes. Analysis of the student questions and activities that are included at the end of most textbook chapters using Bloom's Revised Taxonomy of cognitive skills was also undertaken.

Knowledge, Skills, and Attitudes in Bloom's Revised Taxonomy

The Cambodian policy on curriculum (MoEYS, 2004) provided general statements about the curriculum aims however it has not provided clearly stated learning outcomes for the numerous subjects included in the school curriculum. The subject experts analysed the textbook content using the terms, 'knowledge, skills and, attitude'. These terms were adopted from the third aim provided in the MoEYS policy document (2004, p.4) and the material (its content, sequencing) in the subject and the three grade level textbooks was analysed within these terms.

Bloom's Revised Cognitive Taxonomy provided the framework for analysis of the student questions and activities included at the end of most chapters of the textbooks and descriptive statistics have been generated from this analysis.

Mathematics

In general, all of the mathematics textbooks were written to include learning objectives at the beginning of each lesson. Examples in different sections of each lesson were provided, as well as practice exercises, key points in the lesson summary were provided to assist the student to remember material, exercises for each lesson and chapter were included, and an answer key was provided at the end of each textbook. This format was used consistently in each of the six textbooks (3 for basic mathematics and 3 for advanced mathematics). In addition, the content of the textbooks was arranged in a logical sequential order, from simple ide-

as and skills to more complex ideas and skills. The analysis using the three major learning areas (Attitudes, Skills, and Knowledge) and Bloom's Revised Taxonomy revealed a number of shortcomings.

Knowledge

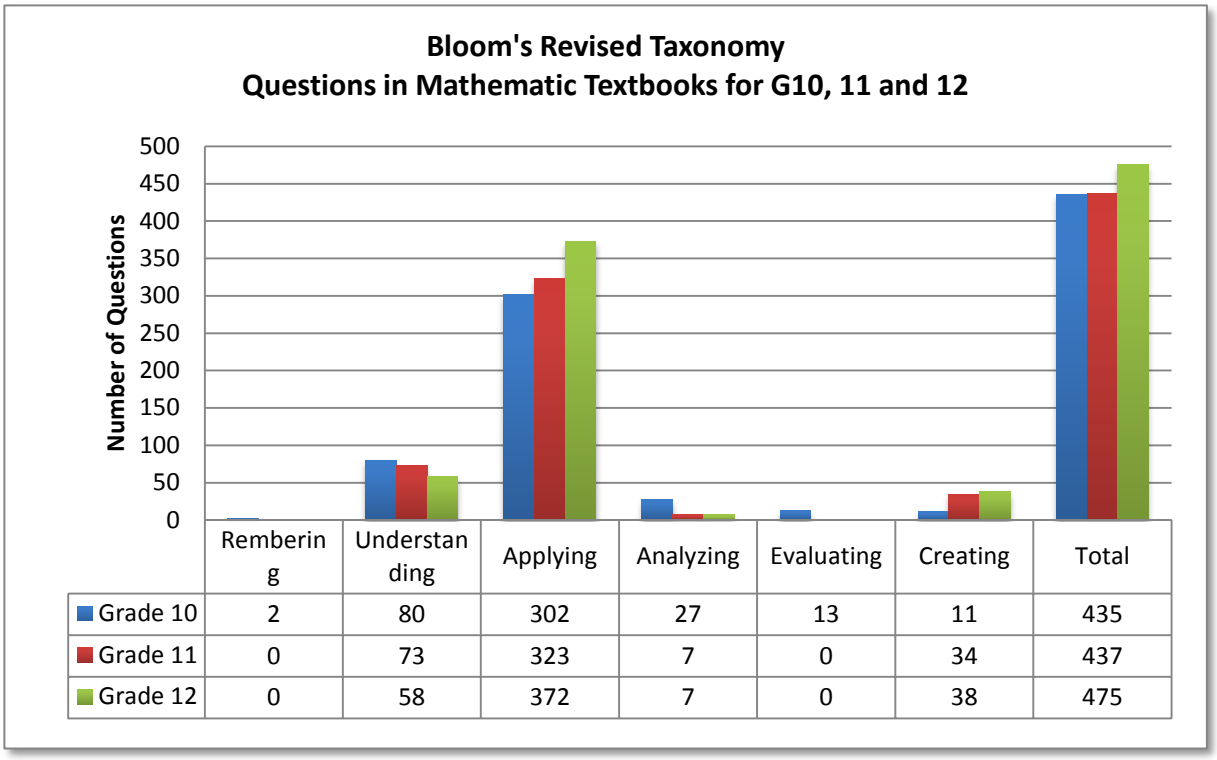
The senior secondary mathematics textbooks were designed to provide knowledge in diverse fields in classical Mathematics.

Skills

The Mathematic textbooks (see Figure 17) focused mostly on the lower order levels of thinking: understanding and applying. There was an absence of questions or activities designed to encourage students to develop skills toward the higher order thinking skills of analysis, evaluation, and creation.

Attitude

It is important to note that the mathematics exercises were applicable to the local Cambodian context. The development of an attitude of inquiry amongst the students is not evident in the textbooks analysed. Students were presented with information and required to practice applying set mathematical formula, but there is little evidence that students were encouraged to investigate, challenge or develop alternative approaches to solving mathematical problems.



	Remberin g	Understan ding	Applying	Analyzing	Evaluating	Creating	Total
Grade 10	2	80	302	27	13	11	435
Grade 11	0	73	323	7	0	34	437
Grade 12	0	58	372	7	0	38	475

Figure 17. Bloom's revised taxonomy-based frequency of different types of questions in High School basic- and advanced-level Mathematic textbooks. (Note: G means Grade Level).

Applied Science: Biology, Chemistry and Physics

Knowledge

In the applied science textbooks, there was a sound description of the nature of subjects. No reference was made about possible relationships of the role of each subject in contributing to improving Cambodian life and the local community. Likewise the information provided in the texts was general in nature without adaptation or reference to the Cambodian context. Topics most relevant to Cambodia: health, food, ecology and agriculture made little specific reference to the Cambodian context.

In most of the textbooks, the presentation of concepts and theory was strongly emphasised as fact without providing explanations or logical reasoning. This kind of presentation does not promote scientific thinking. In the worst case, the textbook provided faulty logic to explain phenomena or information which is out of date. Further, there were no examples of the contested nature of information, e.g. classification is presented in detail without mention that there are other systems of classification or that it is constantly changing in response to advances in technology. In a worse case, Lamark is mentioned as an early biologist who "created one theory of evolution", without mention of how his ideas were subsequently disproven.

Skills

Scientific understanding of everyday objects promotes rational thinking however there were only a few applications of theory that explained everyday objects and materials in the textbooks. This paucity of theoretical explanation fails to develop or encourage scientific thinking processes amongst Cambodia students.

There was an overemphasis on presenting facts and naming things without explanation of the process or outlining a logical reasoning process; this does not promote scientific thinking in students neither does it acknowledge that science is just one way of knowing (epistemology) out of many different ways of knowing. Such a simplistic approach reinforces the idea that science is a type or body of knowledge and that memory and recall of 'facts' is all that is needed. The development of critically thinking students with skills and understandings about different ways of 'knowing' is essential to developing a flexible, highly skilled workforce.

Applying Bloom's revised taxonomy to the textbook activities revealed that many of the lessons operated at the lower cognitive levels of understanding and applying. Importantly, the higher order thinking skills of analysing and creation were largely absent from the textbooks. The questions, exercises and experiments emphasized student recall or understanding of information from the text (level 1 or 2) or the simple application of information to a new situation (level 3) and the experiments were very few and all were optional.

Attitudes

There was little or no recognition of the local context in which the textbooks were being used, e.g. only two photographs were identifiable as distinctly Cambodian (Khmer writing appears in the background). Cambodia is a typical Asian developing country with a predominantly agricultural economic base, but there was a lack of connection with this everyday dimension of most Cambodians' life. This silence on what is 'normal' in Cambodia promotes a belief that science is abstract and theoretical and unrelated to students' daily lives.

There was little attempt to encourage students to question or think for themselves, e.g. statements or instructions were given without explanation. This approach teaches students to simply accept or uncritically follow instructions, it does not encourage them to think logically and analytically or enable them to make independent decisions informed by rational thought

processes. Most potently, the words to analyse, evaluate, to design or create do not appear in any question or exercises in the textbooks.

The textbooks focused most on giving information for students to remember (the traditional teacher-centred approach of distributing knowledge), to be able to identify things, be able to provide definitions, and be able to do simple memory exercises. There was an absence of opportunities for students to practice skills in learning, to think for themselves or to apply the information to their own environment. Most of the exercises were based on examples that students in the remote areas or even in urban areas in Cambodia would have no experience with – they were disconnected from the learner's own context. The exercises were general science exercises where students do not see or have experience of the context that was described in the exercises.

Social Science: History, Geography, and Earth and Environmental Science

Knowledge

The concepts in civics education are relevant to society and social life, however the concepts are introduced without clear explanation and have limited links to daily life and practices in Cambodia.

The textbooks attempted to cover many topics which often led to an inadequate level of depth and detail – there is a surface breadth without depth. Basic descriptions were often provided but frequently lacked explanation or supporting evidence. Concepts tended to be presented without offering logical reasoning or supporting evidence. Theories or hypotheses were often introduced as 'fact' with simplistic, dogmatic, sweeping statements and with no sense of their provisional nature. Theories (e.g. Plate Tectonics, Continental Drift) have been presented as the work of a single pioneer, without explaining the process of knowledge development and growth by which theories are built through numerous contributions, or how they are constructed or evolve over time.

Skills

The textbooks attempted to provide information rather than cultivating skills in identifying and evaluating information. This was reflected in the fact that most questions only demanded simple recall of information and use of memory. Occasionally they assessed understanding, but rarely engaged the higher level cognitive skills.

Values and truth are taught without providing sufficient time or encouragement to question, explore or challenge the ideas being presented. As too many topics were covered, subject textbooks failed to give students enough in-depth contextual background. In addition, further research into deeper and contextual understanding was not encouraged. For example, a unit on gender claimed that women had been greatly valued in Cambodian society yet did not provide a rationale as to why there is now a need for an emphasis on improving women's status in Cambodia.

Attitude

In general, there was no introduction to the significance or value of studying each subject. Engagement with Cambodian society and life was very rare and there was no attempt to bridge the gap/disconnection between what was being learned in school and reality/community life.

Language: English

The textbooks for the three grades have a consistent presentation and layout. Use of cartoon/drawings rather than photos dominated the visual material that was used. The method adopted for teaching English as a second language in Cambodian schools is the inductive method. Using topics that are relevant to the learner's world, the material uses written words and pictures to prompt learner engagement with the content.

Knowledge

Grammar – there were limited materials for the teacher and students to use to develop and practice grammar skills and knowledge. Teachers needed to use other resources to be able to provide students with the necessary multiple opportunities for practice and feedback.

The thinking skills being developed in students through these textbooks were primarily the lower level cognitive skills of remembering, understanding and some application.

Skills

The four skills of speaking, listening, reading and writing are structured throughout the textbooks. Audio cassettes are provided for use for listening and speaking. Anecdotally, this resource is only infrequently used in the classroom.

Attitudes

Many topics throughout the textbooks are overtly dealing with issues of morality, Buddhism and Cambodian ways of living. Students are not required to use higher level thinking skills in most of the material although there were some open ended questions possibly allowing students to explore and express different ways of thinking and ways of viewing the world.

Language: Khmer

The approach to teaching Khmer language was content-based. There was substantial use made of Cambodian fables, folktales and proverbs as vehicles for teaching both the language and the culture. There was a failure to distinguish the differences between folktales and proverbs, and factual knowledge. Students were expected to learn through both 'rule-driven' and 'discovery learning' approach. For examples, Unit 3 of the Grade 12 textbook initially explains to learners about the rules of Hinduism, it then asks the students to follow the rules to complete the exercises. The rule-driven approach was heavily evident throughout all the textbooks.

Knowledge

Traditional literature was the main vehicle for teaching of the Khmer language. Whilst providing valuable material for students to learn about their heritage, there was little link to the real world of the student except for exercises that involve completing legal documents or CV's – both considered authentic learning tasks.

The levels of thinking being developed in the textbooks were at the lower level of thinking skills.

Skills

Reading and writing are incorporated in the textbooks and in the senior grades the use of authentic documents e.g. different legal forms links the learning to the world of the learner.

Attitude

The material used to teach the Khmer language was predominantly religious and folktale based with some later material e.g. how to write a CV in the grade 12 texts that is most evidently connected to the world in which the student lives. There was strong evidence

that students are expected to learn to know (about Cambodian culture, values etc.) however there was little evidence of students learning to value higher order skills of analysis, evaluation and creation.

Concluding Comments

The high school textbook analysis was an interesting process to undertake. Some prominent findings across all the subjects are that the levels of thinking that students are being exposed to and given opportunity to practice are repeatedly at the lower end of the order. This is a concern for a country that is seeking to equip its emerging workforce with skills necessary for engaging with both the wider ASEAN and international communities.

The general failure of the subjects to teach students about the *processes* and *skills of thinking and analysis* reinforces the dominant views held by many students (and teachers) and which are echoed in comments of foundation year students that knowledge is finite and that it is something to be mastered and remembered. The understanding that knowledge is something that is fluid, ever changing and always building on the work of others across many generations was largely absent in the analysis of the approaches used in the subject textbooks and in student comments. Such fixed thinking can create challenges for individuals who are entering the 21st century workforce where knowledge and skills are constantly evolving and demand flexibility and creativity of the individual. Failure to learn that knowledge is also culturally as well as historically bound inevitably limits an individual's capacity to change and grow in the face of the challenges and changes over their lifetime.

Many subjects were found to use nationalistic material as the vehicle for teaching concepts and skills whilst students were not encouraged to develop skills in higher order thinking that would encourage them to view their own, and neighbouring, countries' history and developments with critical mindsets.

Making explicit the important connections between the curriculum and the world in which the student is living was noted as being largely absent in the textbooks especially in the subjects where great contributions to Cambodia's development could be made, e.g. agricultural science, biology, botany, and mathematics.

IV.4 Results and Analysis – Foundation Year Textbook Analysis

The focus of this section (a focus consistent with an objective of this study) is an analysis of the content of Foundation Year student textbooks. This analysis is shaped by the following three questions:

1. What is the relationship between the Foundation Year curriculum and the curriculum of the final two years of secondary schooling?
2. Is there continuity or a disconnection between these different stages of formal learning?
3. Does the Foundation Year curriculum complement and extend the grades 11 and 12 curriculum, or is there repetition?

The analysis of textbooks for specific subjects included in the Foundation Year curriculum was conducted by several academic staff who are employed in the university sector and all of whom are also involved at a university level in teaching in the subject areas of the textbooks they reviewed. These same reviewers also conducted the analysis of the high school textbooks.

Gaining access to textbooks used in Foundation Year subjects provided the team with a considerable challenge and our appreciation is extended to those universities who did provide their Foundation Year textbooks for this study. Individual universities are not identified in this report but have been given a pseudonym in order to preserve anonymity. The team analysed the foundation year textbooks of two private and three public universities.

Table 13

Foundation Year textbooks reviewed

University	Type	Location	Maths	Physics	Biology	Chemistry	English	Social Science
Aa	Public	Phnom Penh	*	*	*	*		
Bb	Public	Regional	*	*	*		*	*
Cc	Private	Regional	*	*		*	*	*
Dd	Public	Phnom Penh		*				
Ee	Private	Phnom Penh					*	*

Math and Applied Science Foundation Year Subjects

Mathematics

The Foundation Year mathematics textbook for students enrolled in the Faculty of Science at University Aa was also reviewed. The *General Mathematics* textbook had been compiled by university staff and was in Khmer. Some overlap of the high school mathematics textbooks was found, but an estimated 50 per cent was new.

University Cc's mathematics textbook for those enrolled in architecture or engineering was provided for this review. The 162 page textbook was in English and whilst there was some coverage of several topics from the high school textbooks there was also considerable focus on new calculus mathematics and its application to the fields of engineering and architecture. The textbook also provided examples and exercises for each lesson as a way of reinforcing and reviewing a student's learning.

Three Foundation Year textbooks from University Bb were reviewed. The Calculus 1 textbook covered topics previously covered in the high school textbooks with the inclusion of some new topics of value for students studying in the sciences. The general observation about the textbook was its lack of detail for each of the topics studied as well a lower level of academic demand for the topics that were included. The Algebra textbook for this university's Foundation Year students contained no new material and was largely a repetition of what was covered in the high school textbooks. The mathematics textbook developed for use by Foundation Year students in the university's Faculty of Business and Tourism was a mixture of material covered in high school textbooks and new material – financial mathematics, and fundamentals of statistics. These two new sections provided numerous practical examples and discussed the topic in considerable depth.

Physics

University Aa's Foundation Year provides two different physics courses – one for those in the department of Computing Science and Engineering (*Physics for Computing*) (45 hours) , and one for those enrolled in either the department of Physics or other departments (*General Physics*) (45 hours). The *Physics for Computing* textbook included material covered in the high school textbooks and also material that allowed a practical understanding of topics as well as providing more in-depth content.

The *General Physics* textbook, which was designed to cater for those with little or no prior high school background in the subject, was largely repetitive of the high school textbook with the inclusion of some material not covered in the high school textbooks.

University Bb's foundation year physics course (45 hours) textbook (100 pages, English) had little or no new material except for a section on calculus. The material was largely repetitive and had low a level of difficulty.

University Cc 's Foundation Year physics course (45 hours) textbook (40 pages, English) was found to be similar to that described above for University Bb; most of the material in the textbook had already been covered in the high school textbooks resulting in repetition rather than a deepening or broadening of concepts and skills.

Chemistry

Two foundation year chemistry courses textbooks were provided for this review. University Aa offered a course of 216 hours across two semesters of Foundation Year chemistry for all students enrolled in chemistry majors. The textbook used is a Khmer translation of a university level American chemistry textbook of which 14 of the 25 chapters were taught in the first year. Most topics in this university's Foundation Year course are found in the high school textbooks however 66% of a Foundation Year student's time was based in the laboratory in order to address the total absence of laboratory work during their high school studies. The textbook content was both broader and deeper than that covered in high school textbooks and this was valuable for concept continuity as well as reinforcement rather than simple repetition. There were many higher order thinking exercises (at least 100 per chapter) at level 5 of Bloom's cognitive taxonomy (analysis). Finally there were numerous examples in the textbook that related the chemistry being studied to everyday life.

University Cc's Foundation Year one semester chemistry (45 hours) textbook is a 43 page book consisting of 8 sections and was in a mixture of English and Khmer. Each topic is briefly described and the content is the same as, or lower than, the same material covered in the grade 12 textbooks. There are a few practice examples at the end of each of the 8 sections and all exercises were at a level 1 or 2 of Bloom's cognitive revised taxonomy (simple recall and remembering). University Cc's student book includes mention of use of laboratories in the description of instruction in the course although it is unclear how this would be possible in the absence of any laboratories on the campus.

Biology

University Bb provides a one semester Foundation Year biology course (60 hours) and textbook for students enrolled in a Bachelor of Science degree. The 33 page course book, the only material that is provided to students, lacks any problem solving exercises. The content level is lower than found in the grade 11 and 12 high school textbooks, and it is doubtful that the course description and student notes can fulfil the role of a Foundation Year university course intended to provide a bridge between weak high school knowledge and university.

University Aa's Foundation Year one semester biology course (64 laboratory hours, 32 class based hours) and textbook is a Khmer translation of an American introductory university level biology textbook. Laboratory exercises were taken from another American university's laboratory exercises manual. Most of the topics in this textbook are also found in the high school textbooks. A significant difference is the inclusion of laboratory based learning, a feature not encountered by students during their high school learning. The coverage and depth of topics is also much deeper than that in the high school textbooks which is valuable for both continuity and reinforcement rather than simple repetition.

Social Science and English Foundation Year Subjects

Various social science subject textbooks

The following Foundation Year textbooks have been placed under the heading of Social Sciences but, due to the labelling of the different foundation year social science subjects, the match to the upper secondary school textbooks are not as obvious or immediately apparent as for the maths and science subjects. In many cases the reviewer found that material in the Foundation Year textbook was found in two of the upper secondary school textbooks.

University Ee – social science textbook

The subject Khmer Civilization was studied in the Foundation Year Course at University Ee. The course textbook was in Khmer, and was 166 pages in length, representing 45 hours of class contact (3 credits). The textbook had been compiled by the university academic staff. An estimated 40% of the textbook's content covered the same material that was in the high school textbooks. The content in the textbook was structured around individual lessons and did not include any student exercises.

University Bb – social science textbooks

The following textbooks were from University Bb which includes six Social Science subjects: Philosophy; Khmer Culture; Khmer Folktale Literature; Economic Geography; Khmer History; and Social and Political History.

The Philosophy textbook was written in Khmer by university academic staff and consisted of 10 chapters (227 pages). Topics included Philosophy: Its nature and place in society; Philosophical Fields; Methods of Inquiry; The Nature of Man; Knowledge; Values; Ethics; Social and Political Philosophies; Philosophy of Religion; and Contemporary Philosophical Views. Most of the topics in the textbook were new when compared to those in the high school textbooks. There were a few concepts in the textbook that were similar to those covered in the high school textbooks but the content was found to be broader and deeper. A reference list was included at the end of the book. There was a consistent style between each chapter such as a summary of the chapter, study guide, terminology, and review questions.

The Khmer culture textbook was a 145 page book of six chapters written in Khmer and compiled by the university academic staff. Approximately 90 per cent of topics covered were new. The book focused on Khmer culture, belief and custom, religion, language and education, literature and art, and architecture. A list of references was included at the end of the book. The textbook was more of a descriptive text, so it is doubtful if the students had opportunities to think critically during class.

The Khmer Folktale Literature textbooks consisted of two books with a total of nine chapters (257 pages) and was compiled and written in Khmer by university lecturers. Approximately 30 per cent of the topics covered in the textbooks were similar to the topics in the high school textbooks. Many new folktales were introduced however the materials appeared to be largely descriptive and did not include activities or exercises that involved higher order thinking skills.

The textbook labelled Economic Geography appeared to be a mixture of two high school level subjects - Geography and Economics. The textbook was a Khmer language 67 page book of 3 chapters. The topics contained little new material and were estimated to be 80 per cent repetition of the material covered in the high school textbooks. The book contained largely descriptive lessons and required only low level thinking skills. The book ended with a list of multiple-choice exercises and questions followed by answers. The exercises were

mainly on-the-line questions which required students to memorize and did not require higher order thinking.

Khmer History, and Social and Political History— were also reviewed from University Bb. The two books can be paralleled to the History textbooks in high school. Khmer History was in Khmer language and had seven chapters (164 pages). The book was compiled by the university academic staff and did not include a bibliography, student activities or exercises. The Social and Political History textbook focused on world history and consisted of six chapters (57 pages) and was in Khmer. Similar to the Khmer History foundation year textbook, the Social and Political History textbook consisted of descriptive lesson content and no exercises or further reading were provided. The content of both books was largely a repetition of, and at the same level to, what was covered in the high school textbooks.

University Cc social science – Foundation Year textbooks

Basic Cultural Studies is a 45 hour semester long subject at University Cc. The textbook was written in English and was 73 pages long. Topics covered were: introduction to culture, Cambodian society and customs, the traditional cultural values of Asia, Asian festivals and games, and Asian families. There was referencing at the end of the book. The topic and content were assessed to be deeper than what was found in the high school textbooks

The History of Khmer Institutions was taught over a 45 hour semester at University Cc. The textbook was in Khmer and consisted of 62 pages. The topics covered were: a general perspective of institutions, a history of Khmer institutions in the Nakhon Phnom and Chenla Era, the King as an institution in the Angkor and post Angkor periods, Khmer political institution management in French period of colonization, Khmer political institutions in 1953-1970, the Khmer political institution in the time of the Khmer republic, and the political institutions of the Kingdom of Cambodia. There were references at the end of the book.

English Language

The Foundation Year textbooks of three universities were reviewed. All three universities, Bb, Cc and Ee were using commercially produced English language textbooks to teach Foundation Year students enrolled at their institution. University Bb used *Building Skills* (published 2010, 185 page textbook, 125 page workbook) University Cc was using *New Headway* (published 2004, 117 pages) and University Ee was using *World English 2* (published 2004, 154 page textbook, 80 page workbook).

Each university's foundation year English language course was a two semester length subject studied for 45 hours per semester. As commercially produced and professionally developed English language textbooks, the original books were of a high standard in their production although students used photocopies of the books rather than original text and workbooks. The structure of the course focused evenly on the four macro-skills of reading, listening, speaking and writing and the use of a range of interesting and different language activities are central to the approach adopted to learning in these textbooks. Topics of an international orientation are used throughout the books as is to be expected from textbooks produced for a global audience.

The Foundation Year textbooks highlight considerable gaps between content covered and skills practiced in the high school textbooks. The high school textbooks do not adequately prepare students who are enrolling in Foundation Year English language programs that are using the material and approaches to learning found in the three university textbooks reviewed.

Summary Comments

As is evident from the reviews of a number of the Foundation Year textbooks from several Cambodian universities in both the sciences and the social sciences (including languages) there is a very uneven quality across the subjects and between the universities. It was found that repetition of content covered in high school textbooks was the usual pattern with only a little extension of concepts/skill evident in most of the texts in this review. In at least one instance, the content provided in a Foundation Year textbook was considered to be lower than that of the high school textbooks.

The attempt by University Aa to address the paucity of laboratory experience amongst Foundation Year science students is noted, as is the adoption of a fully Khmer translated version of a university level American textbook for two of the science subjects. The use of commercially and professionally developed English language textbooks for the three Foundation Year textbooks reviewed highlights the inadequacy of the current high school textbooks that are intended to provide the foundation on which university level English language is to be built. Students with only a high school background of English language study based on the nationally developed textbooks would be facing a wide gap between their existing knowledge and skills and those assumed by the university textbook.

Chapter V: Result Analysis and Interpretation

V.1 Research Question #1 — Technical and Employability Skills

To what extent has the Curriculum Reform at upper secondary school equipped young people for entering the world of work directly from secondary school, i.e. providing them with adequate technical and employability skills?

This first research question is addressed below, approaching it from the points of view of the alignment of intended curricula, the taught curricula, and learned curricula with the skills needed by the labour market. The answer is elaborated while drawing from data of multiple origins: curriculum development policy, textbook analysis, employed school leavers' responses, as well as third-party research reports on related issues.

Contribution of Intended Curricula to Skills Needed by Labour Market

The Cambodian economy is largely informal, and is dominated by the primary sector. In such a context, the ability to collect and analyse secondary school leavers' perceptions (primary data), in combination with employers' perceptions (secondary data) is particularly precious. An analysis is presented in the next section immediately below. It is followed by a discussion on the contrast between the skills needed with the upper secondary school (USS) curriculum developed by MoEYS in 2005, also referred to as "intended curriculum" below.

Review of employed school leaver's perceptions

There is no data available on the Cambodian informal economy aggregated by age and level of education, however, anecdotal evidence reveals that more and more young people with some amount of higher levels of education are working in the informal tertiary economy. A sizeable percentage (67%) of surveyed respondents reported working more than 40 hours per week, which is an indicator of informal economy employment conditions. We surveyed those who were working in a family business and the informal private sector to determine their views of the skills needed for entry to employment or business. The survey found that for those who were self-employed and working in a family businesses, the needed skills were reported to be calculation, decision making, supervision and management, team work and punctuality. For those who worked in private companies (not family businesses), communication was reported most frequently, followed by skills in calculation, English language and computer skills (see Figure 13 for more detail).

Review of employers' expectations (third-party studies)

Recent studies by CAMFEBA (2008) and JICA (2012) as well as reports by the World Bank (2012a, 2012b) have helped describe, and to some extent quantify skill gaps based on Cambodian graduates' perception and Cambodian employers' experience in the secondary sector of the formal economy. In particular, CAMFEBA's study pointed to a dramatically high proportion of high school students (96%) holding the view that they were underequipped to enter the world of work. This paralleled 87% of surveyed employers who considered Cambodian youth to have either irrelevant (11%) or insufficient (76%) skills. Those studies all reported *technical skills* as those predominantly needed among the majority of employers — a trend that has been characterising the Cambodian economy for the past two decades and still prevails. In a JICA report (2012), 53% of surveyed employers expressed that "being able to do something is more important than knowing".

The same studies reported employers also emphasising the importance of *combined technical and generic skills* (or "hard" and "soft" skills) and difficulties in finding such skill combinations among job seekers — see Figure 5 and Figure 6 in the early sections of this report reproducing data by CAMFEBA (2008). The latter data was echoed in the more recent study by JICA (2012), which stated *"However, at the moment the need for workers even with a lower level of education who have acquired the knowledge, skills and attitude useful in society, is higher than the need for advanced industrial human resources."*

Moreover, employers are shown to be willing to bridge the technical skill gap by supplying complementary training to new employees. According to CAMFEBA (2008), 43% of surveyed employers resorted to external training providers and 48% of surveyed employers chose to supply on-the-job training to promising Cambodian nationals rather than hire non-Cambodian employees (JICA, 2012).

However, such willingness of employers to invest in complementary training also comes with expectations in terms of basic skills, i.e. skills that should have been acquired before employment e.g. during (upper) secondary school. These are summarised as follows in a JICA report (2012): "(1) Scientific way of thinking; (2) Basic technical skills acquired through experience; (3) Work ethics and business behaviour in the modern industrial society." These expectations are captured in Fig.18. These three sets of skills are well reflected in various skill dimensions reported in our survey of employed school leavers. Therefore, we will use these three set of skills for our analysis.

That *knowledge-skills-attitudes* triad is used as our analytic framework throughout the present discussion when assessing curricula and its contribution to employability.

Figure 18. Expectations for basic competences.
(Source: JICA, 2012)

Contribution of the intended curriculum to knowledge development

Knowledge development is evidently at the very core of the USS (MoEYS, 2004, p.5), as seen in the literature review section of this report. Students are offered the opportunity to opt for either *applied sciences* such as biology, chemistry, and physics or *social sciences* such as history, geography, and Earth and environmental sciences according to their own inclination. This is in addition to a common set of mandatory topics: *Khmer literature*, *a foreign language*, and *mathematics* — all of which have been identified as particularly relevant by employers surveyed (CAMFEBA, 2008) (World Bank, 2012) (JICA, 2012). In addition, a range of electives cover equally relevant areas such as vocational technical subjects, accounting and business management, and also ICT and technology. For example, the need for better computer skills is referred to by 30% of employed respondents working in the public sector (this report, Figure 13) and by 39% of graduate respondents in CAMFEBA (2008).

Contribution of the intended curriculum to life skills development

The notion of so-called "Life Skills" was expanded in the 1990's with the aim to produce a pool of young people who are ready to enter directly into the labour market at some point during their secondary school. This initiative emphasized a skills-based approach to learning. These skills were described in the USS policy document (MoEYS, 2004) as being "intellectual, personal, interpersonal and vocational skills that enable informed decision-making, effective communication, and self-management skills". The policy document also identified additional learning objectives including students being able to (a) acquire employment-related skills; (b) analyze and work towards solutions of problems experienced while in society. In addition, specific requirements directed to policy implementers were as follows: Schools will (a) "Provide learning environments that will enable students to *learn to do*;" (b) "Emphasize active and applied learning in all subjects across the core curriculum, including the study of technology". This too, such as in an emphasis on experience-based development of skills is very much in alignment with employers' expectations and employed school leaver's perceptions of their skill needs.

Contribution of the Intended Curriculum to Employer's Expectation and Employed School Leavers

Another important goal of the USS policy reform was to provide students with a learning environment where they are able to "learn to be" and "learn to live together". *Working effectively and harmoniously with others, taking responsibility for their own actions and decisions, being self-reliant, maintaining a positive attitude toward work, exercising judgment and responsibility in matters of morality* — all such traits are identified in the USS policy document (MoEYS, 2004). These also very much align with employers' expectations and employed school leavers' perceptions noted in CAMFEBA (2008) namely: *self-confidence*, *self-motivation, self-reliance*, *self-discipline, strong commitment to results, being patient* yet *dynamic* and *being hard-working*. These types of characteristics are important to the qualities this survey identified as being needed namely: team work, communication skills, punctuality and decision making.

Contribution of Taught Curricula to Meeting Employers' and Employed School Leavers' Expectations

In this section, we take into consideration the context of the Cambodian secondary school system whereby the primary source for the intended curriculum is the state developed and supplied textbooks. Consequently, *the question of the contribution of taught curricula to meeting employers' and employed school leavers' expectations* is approached from the angle of *the contribution that secondary school textbooks make to meeting employers' expectations and those of employed school leavers too*.

Scientific way of thinking

In the high school textbook analysis presented earlier in this report, Mathematics textbooks are said to cover mostly lower order levels of thinking such as understanding and application, but failed to encourage students to develop higher order thinking skills such as analysis, evaluation, and creation. The applied science textbooks i.e. Biology, Chemistry, Physics, and Earth and Environmental Science were said to emphasize the *descriptive dimension of the scientific process* and *promote rational thinking*, however they failed to develop other dimensions of scientific thinking such as *contextualisation*, *logical reasoning*, and *refutation*.

In most of the textbooks, the presentation of concepts and theory was strongly emphasised as fact without providing explanations or logical reasoning. This kind of presentation does not promote scientific thinking. In the worst case, the textbook provided faulty logic to explain phenomena or information which is out of date. Further, there were no examples of the contested nature of information, e.g. classification is presented in detail without mention that there are other systems of classification or that it is constantly changing in response to advances in technology. In a worse case, Lamark is referred to as an early biologist who "created one theory of evolution", without mention of how his ideas were subsequently disproven.

Concepts covered in the social science textbooks such as History, Geography are said to be descriptive and relevant to society and social life, however they missed the opportunity to illustrate the process of knowledge and theory development. Both English and Khmer textbooks only developed lower level cognitive skills such as *memorising* and *understanding*.

These findings suggest a weak potential for textbooks to successfully match employers' expectations such as: a) the skills for questioning the reason behind a direction; b) inves-

tigating root causes behind observations e.g. assembly line defects. Analytical skills such as these were expected by 19% of surveyed employers of unskilled workers in CAMFEBA (2008), and by 64% of surveyed employers of skilled workers in a World Bank report (2012a); c) the ability to critically question one's own career path, as mentioned in JICA (2012).

The importance of secondary education in establishing basic knowledge of maths, science and technology, as well as the skills to think critically and creatively is also recognised in Chalamwong et al. (2012), who regard such skills as catalysts for organisations being able to successfully adopt and adapt in an ever-evolving workplace, and develop and apply new technologies.

Beyond employability skills, the negative implications of workers who have underdeveloped scientific thinking potentially extend to affect the essential abilities of the organisation or the company to function well. These include, for example, a difficulty for the workforce to apprehend the rationale behind managerial changes, i.e. a difficulty to fully appreciate the necessity for organisational development. This can in turn manifest as a higher *resistance to change*, thereby reducing the firm's potential to adapt in a rapidly evolving and restructuring economic context.

Basic technical skills acquired through experiential learning

The high school textbook analysis reported that Grade 12 Khmer language textbooks included exercises on how to write a CV, thereby helping develop direct employability skills. It made use of a variety of textual material e.g. legal forms, thereby helping students gain acquaintance with real-world textual forms. However, Khmer language textbooks were also found to engage students mainly in lower-level thinking skills. Applied science textbooks i.e. Biology, Chemistry, Physics, and Earth and Environmental Science were reported to emphasize memorisation and understanding of information from the text (level 1 and 2 of Bloom's revised taxonomy) or the simple application of information to a new situation (level 3) — however they missed the opportunity to use applied sciences as a learning opportunity for hands-on experimentation: "Most potently the words to *analyse*, *to evaluate*, to *design* or *to create* do not appear in any question or exercises in the textbooks." No reference was made to the possible role of each subject in contributing to improving Cambodian life and the local community. Likewise the information provided in the texts was general in nature without ad-

aptation or reference to the Cambodian context. Topics most relevant to Cambodia; health, food, ecology and agriculture made little reference to the Cambodian context.

Social science textbooks such as History and Geography were found to also only engage lower cognitive processes. They missed the opportunity to use social sciences as a fertile ground for *contrasting ideas*, *questioning theories*, and *deepening investigations*. English language textbooks were found to invite discussion contextualising the acquired knowledge, however they primarily engaged lower cognitive skills.

Evidently, some of the textbook content is in direct alignment with highly demanded skills such as mastery of Khmer language and English language. However, this was often not the case. Over 30% of respondents in the self-employed category (see this report, Figure 13) stated that they needed greater skill in making calculations. This is a skill which mathematics textbooks are supposed to help build. It is important to note that despite the policy to introduce and strengthen learning ICT skills and the provision of ICT resources, Information Technology as an elective vocational course in upper secondary school is not yet available, nor has any school textbook been produced regarding ICT.

To some extent at least, high school textbooks appear to be contributing to increasing students' employability. However, findings presented in the paragraphs above suggest a weak alignment with employers' needs overall in terms of hard and soft skill combinations. The majority of surveyed employers (53%) in the JICA study (2012) expressed that "being able to do something is more important than knowing". Another hint of the importance of practical experience in employability is given in CAMFEBA (2008), which stated that *lack of experience* was the reason for rejection of 42% of students' internship applications. A further pointer to the lack of practical skills is that 30% of employed respondents working in the public sector (this report, Figure 13) and 39% of the graduate respondents in CAMFEBA (2008) reported that they needed more computer skills. Overall, the three most frequently cited subjects or topic areas identified as needing further focus in high school studies to better prepare young people for the world of work were mathematics, foreign languages, and computer/internet skills.

Attitude, behaviour and ethics at the workplace

In the high school textbook analysis of Khmer language textbooks, they were reported to convey Cambodian culture and values, and contextualise the teaching through religious or

folktale material. Similarly, the high school English textbooks dealt with issues of morality, religion and Cambodian ways of living. Social science textbooks were found to fail to emphasise the significance or value of the studied topics in the society, also missing the opportunity to bridge the gap between taught curriculum and community life. A similar disconnection or lack of contextualisation was reported for the content of applied science textbooks.

While high school textbooks did appear to contribute to reinforcing sociable attitudes, it remains unclear to which extent these textbooks actually contribute to developing specific work attitudes or traits as quoted in CAMFEBA (2008) namely *self-confidence*, *self-motivation, self-reliance*, *self-discipline*, *strong commitment to results, being patient* yet *dynamic* and *hard-working*. That same study identified such *suitable work attitudes* as the most difficult quality to find among unskilled workers, as reported by 52% of surveyed employers.

Contribution of Learned Curricula to Prepare Student for the World of Work

In this section, we synthesised data from the survey as well as secondary data on students' own perceptions in order to assess the degree of learned curricula alignment to the labour market's expectations.

The respondents' perceptions of the contribution of their high school experience (learned curriculum) to their own job readiness was been reported in the section titled "Value of school for the world of work" (See Figure 14 and Figure 15) and shows a spectrum of perception spread widely. Less than 50% reported that their schooling did not prepare them well enough. Such data parallels with secondary data found in CAMFEBA (2008, Figure 49) on perceptions of the minimum level of education needed to find a job. More specifically, while asked about the job-hunting skills that are the most difficult for them, CAMFEBA respondents acknowledged feeling underequipped with "Writing the Cover Letter" (18%) or "Preparing for Interview" (17%) (2008). From the point of view of employers, 93% of CAMFEBA's respondent's recognised *internship, volunteer,* or *part time jobs* as a key factors to securing a first job — thereby hinting at a deficit in the intended curricula.

Summary Remarks

Encouraging knowledge sharing across high schools

The alignment between the intended curriculum developed and described by MoEYS (2004) in the USS policy document, and the actual employers' expectations and employed

school leaver's perceptions of skills needed to enter the world of work and perform well at the work place cannot be questioned. In principle, the needed skills are all taken into consideration in the curriculum policy. The present study however has revealed a gap between high school textbooks — i.e. the taught curricula — and employers' expectations and employed school leaver's perception. That gap is confirmed by the analysis of the data which concluded only a weak alignment existed between the learned curricula and employers' expectations especially in relation to the 'soft skills' of critical thinking and decision making. Therefore the issue arises as to identifying reasons for such gaps.

Lack of suitable resources or teacher capacity, inadequate education financing, issues with teaching quality at the level of secondary schools have been cited by Chalamwong et al. (2012) as factors of possible influence. These could indeed explain some of the missing links between the intended curriculum, the textbooks, and the desired outcomes.

For example, local life skill programs and elective vocational subjects were officially introduced by the Cambodian education policy in response to the increase in demand for technical skills and because of skill shortages. However, the implementation of such programs requires not only financial resources, but also the capacity to identify and describe accurately the skills needed by employers and the local community. Unfortunately, the Cambodian government has neither the budget nor the human resources to implement such a program. Instead, the government identified the life skills program as an opportunity for parents, local communities, and NGOs to cooperate and work together to provide training in specific skills that have a particular relevance to their local economy. However, the objective of making the program contribute to the development of the local community has not materialised for at least two reasons. First, there is a lack of funding for the numerous poor communities which have been unable to mobilise resources to implement the program. Secondly, although some schools can mobilise resources to implement the program, they have not been able to provide appropriate skills for community development possibly due to poor consultation or engagement with the community and local employers (Un, 2012).

A field visit revealed that local life skill programs rarely extend beyond traditional skills (weaving, carving and traditional dance and music). Keng (2009) argues that in Cambodia the foremost constraint on handling education reform effectively is the lack of capacity at both individual and institutional levels. School directors are known to lack qualifications, skills and experience which in turn hinders their capacity to plan and analyse community

needs and related life skills, while on an institutional level, teacher training institutes are unable to train local life skill teachers, so schools have difficulty finding such teachers (as quoted in Un, 2012).

A range of policy implications is presented in the final section of this document. Most of them revolve around the opportunity for harnessing mobile knowledge-sharing technologies as a way to foster the collection of complementary knowledge around the intended curriculum's content.

V.2. Research Question #2 — Readiness for University Studies

To what extent has the Curriculum Reform at upper secondary school equipped young people to pursue university study directly from secondary school?

In answering the second research question the data from curriculum policy, the high school textbook reviews, and the student comments have been integrated.

A university is an educational institution that, at undergraduate level, usually seeks to extend and deepen a student's knowledge and skills in a narrower field of study than in high school. It is a place where to be academically successful students need to engage in many different tasks and activities including advanced cognitive exercises and active participation in their course material (Reason, Terenzini & Doming, 2006). The advanced cognitive practices at university require students "to analyze, synthesize, judge and apply information" that they have received in their high school classroom and laboratories. (Reason, Terenzini & Domingo, 2006, p. 170)

Contribution of the intended curriculum in preparing students for university study

It is clearly stated in the policy that the purpose of upper secondary curriculum is not only to expand and consolidate the student's knowledge gained from their nine years of basic education, but also to provide them with opportunities for future orientation – that is to have the capacity to continue on to university study if they so choose. The policy clearly mentions three aspects which are intended to provide students with skills for further study: first through gaining a broad understanding of the natural world and of scientific principles, second through a high level of communicative competence in a foreign language, and third the inculcation of a love of learning that will enable each student to continue life-long learning.

Contribution of taught curricula to prepare student for university study

In light of the findings from the high school textbook analysis which analysed the levels of thinking evident in both the assignments and learning activities, it is clear that the provision of opportunities to learn and to practice operating at the higher levels of thinking are mostly not evident. With most of the formal classroom learning time and effort being given to simply recall and memorisation of study material, students had not had opportunities to develop skills of analysis, synthesis and creation, three of the higher order thinking skills needed for effective engagement with new ideas and concepts. Group work or individual assignments that require students to engage in self-directed, independent research and cooperative learning is also not evident in the textbooks. It is therefore a considerable challenge for Foundation Year students when they first encounter an expectation that they will have already developed some level of skill in higher order thinking, as well as group work skills.

Contribution of Learned Curricula to prepare students for university study

From the phone interviews, students reported that regarding technical knowledge in some subject areas, their high school seemed to have prepared them well for university, but that the learning skills needed for studying successfully at university were largely absent. Students in this study reported very different learning experiences at high school compared to those in university. Among the chief differences were their experiences in working together in groups, learning in laboratory settings, and learning to think critically. Other areas identified from student feedback where they felt unprepared for university study included having inadequate skills in computer use, presentation skills, research skills, skills in laboratory-based learning, and skills in understanding (compared to memorising in high school). In view of the MoEYS Curriculum Policy statement for the outcome of the intended curriculum being that the school will 'emphasize active and applied learning in all subjects across the core curriculum, including the study of technology' (2004, p.4), the reports from many of these Foundation Year students reflect a different outcome (learned curriculum) to the stated aim (intended curriculum) and point to areas for future development.

Summary Remarks

Using the language of constructivism, it would be accurate to write that the students' learning had not been scaffolded at all well by the high school textbooks to prepare them for the higher level thinking, technical skills, and group work skills they reported encountering during their first year of university study. An extension of this comment would be that in light

of the usual practice of Cambodian high school teachers using the textbooks as their principle if not sole source of learning material for classroom teaching, the classroom learning and teaching practices of high school do not equip students with the higher order thinking skills or technical skills needed for further study.

V.3 Research Question #3 — Overlapping between University Foundation Year and High School Textbooks

— To what extent did the Foundation Year textbooks broaden/deepen the ideas/concepts/material covered in the textbooks used in high school?

The discussion on the third question was based on high school and Foundation Year textbook analysis conducted by subject experts, their reports as well as on students' views of their experiences.

As is evident in the textbook analysis, there is considerable unevenness in the quality of textbooks as well as in the amount and depth of the content covered in the Foundation Year textbooks. The overall finding was that there was considerable repetition of USS material in most the Foundation Year textbooks, indeed in at least one instance content levels were lower than the high school subject content. In a few subjects some material new to what had been covered in the high school textbooks was identified, especially the introduction of subject major that foundation year students require to take.

With one of the aims of Foundation Year being the creation of system that allowed the option for students to transfer seamlessly between institutions after completing their Foundation Year, what was immediately apparent was the difference in content covered in the same subject areas between the textbooks of the different universities. Assuming that this wide variation also exists between most Cambodian universities that are teaching the same subject e.g. mathematics, physics, English language and so on, the students have not been well prepared to continue their second year with a different institution should that be their intention.

The use of three different commercially developed English language textbooks by the three universities included in the study highlights the absence of Cambodian-developed English language curriculum resources that are considered appropriate by the curriculum decision makers within institutions. The decision making processes involved in the selection of a specific English language textbook are unknown, but the adoption of three different commercially available textbooks by the three different universities underlines the absence of common key area learning goals for the English language subject across the Foundation Year program.

This also then raises the question of how transferable the skills and knowledge taught in the English language courses are between the different universities.

Textbooks provide the evidence of the institution's intended curriculum and there clearly are differences in the quality and depth of subject content covered between the textbooks of the different universities reviewed in this study.

The learned curriculum, what is actually learned by the students, was explored in several questions included in the phone interviews and survey of Foundation Year students. Foundation Year students who completed the pen and paper survey reported learning new material in their Foundation Year subjects and also identified History and Khmer Culture as two subjects with the same content as their high school subjects. The phone interviews allowed for more detailed responses regarding the students' perceptions of overlap and difference between material studies for a subject in high school and in their Foundation Year. Most of those interviewed reported experiencing a similarity between high school and Foundation Year subject content and also some differences. The subjects of mathematics, Khmer and history were most frequently identified as having the same content as in high school.

There is little evidence, with a few notable exceptions, that the Foundation Year textbooks in this study have extended, broadened or deepened the knowledge or skills of the students that use them. Questions about transferability between universities after completion of foundation year then arise, as do questions about the purposes of the Foundation Year, the processes of curriculum and textbook development in university, as well broader questions about the purposes of high school, purposes of an undergraduate degree, and quality control of what is learned.

Other Findings

Respondent profiles and motivations.

In both the Employed group and among those doing Foundation Year studies, the 19-23 years age grouping was the largest and it accounted for 75% of the Employed group and 86% of the Foundation Year. This is a positive sign for Cambodia as it indicates that school age children are now increasingly being enrolled in school at the appropriate age. Further, our finding is similar to that found in the HR Inc. report (2008) in which the post-high school aspirations that were reported revealed that most respondents showed an intention of continuing their study (Figure 10). This is a positive sign for Cambodia's future human capital develop-

ment once appropriately resourced educational providers are in place with the appropriate monitoring devices for quality and once consistency is also developed and implemented.

Another positive sign is that many young people reported that they chose the Natural Sciences in high school (Foundation Year students, 77% and Employed group, 55%) which is a subject major choice that can feed into fields that are greatly in demand by industry and needed to aid in the development of the country. However, to reap the benefits of the large numbers selecting the natural sciences, high school career education and counselling programs need be developed, and more guidance by classroom teachers is needed, as no respondents reported choosing their subject major because they enjoyed the subjects. If young people and schools are to have access to accurate and timely information about labour market needs, both short and mid-term, as well as information about different pathways to employment then the further development of the National Employment Agency (NEA) or some other government resourced agency is needed. It will also require stronger links between government and employers whereby skill shortages can be identified and the information made widely available. Finally, to make informed decisions about career pathways young people need accurate and timely information about courses of study, whether at university or TVET, and their entrance requirements and costs etc. This requires post-secondary education institutes to develop and promote various courses of study as well as providing information about links between employment and graduate opportunities.

Chapter VI: Conclusion

V.1 Summary

This study has reported the findings from two significant groups of people whose voices have largely been unheard prior to this study in discussions about the goals and purposes of upper secondary school and foundation year programs. Firstly the voices of the young people who have been the target of government policy education reform have been collected and given a platform, and secondly, subject experts have provided a review of the quality of high school and foundation year textbooks. The study also compares these findings with existing related research reports.

The issue of the alignment between the intended curriculum developed by MoEYS (2004) for the upper secondary school grades and the actual needs of the labour market is addressed in this study through listening to the views of employed school leavers and through reviewing relevant textbooks. The review identified serious deficiencies in the current textbooks (content, approach to teaching about knowledge, thinking skill development) as well the complete absence of vocational subject textbooks.

The textbook reviews uncovered abundant evidence that students are required to perform only at low levels of thinking for mastery of the subject content. There was an obvious focus on recall and memorisation rather than a development of deep levels of understanding through learning and practising different ways to engage in critical analysis, synthesis of ideas and concepts, and creation of new ideas. Students have been poorly prepared for creative, critical, original thinking by the textbooks they work with in the senior grades of high school. This is also supported by the answers from our Foundation Year sample who commented on insufficient opportunities at high school to develop skills in team work, decision making, communication, and analysis.

Evident from the study is the mismatch between the skills, attitudes and knowledge employers have been reporting that they need and are struggling to find, and the skills, knowledge and attitudes being taught at school. Both students and employers have identified a paucity of 'soft skills' among those seeking work. This deficit includes the poor preparation of high school students to operate effectively in a work environment that requires creative and analytical thinking skills as well as highly developed skills in interpersonal communication and behaviour. With an apparent absence of dialogue between employers and textbook devel-

opers, the students are being taught in a vacuum that has failed to make clear the links between what they are studying at school and the wider world of work.

Likewise, high school graduates are poorly equipped to engage with the wider world, whether in further study or work, in which flexible thinking and creativity, learning how to learn, English and computer skill are essential for effective functioning. These skills are especially needed in a country like Cambodia which is seeking to engage productively with the wider ASEAN and international economies and education systems.

The study also found that high school education does not prepare students well for university education in skill areas such as: computer use, presentation skills, research skills, skills in laboratory-based learning, information literacy skills, and skills in analysis and creativity. Questions about the examination system are also raised by these findings. What is being examined in grade 12 exams, a good memory or deep understanding? What has been given value by the present examination system? Is it recall and rote learning, or learning for understanding and learning how to learn?

The unevenness in textbook quality across the five universities that were reviewed for this study highlights areas of concern needing to be addressed if Cambodian young people are to be able to compete on the ASEAN and wider international stage – whether in innovation, research or their professional lives. The repetition of content reported by the reviewers as well as the content differences across the universities within a specific subject raise grave concerns about the quality of learning being provided at the Foundation Year level. This in turn raises questions about the quality of undergraduate degree courses which are building on such an uneven and generally low quality of Foundation Year learning. Questions, then, need to be raised about the quality of Cambodian university postgraduate programs that are, theoretically at least, building on existing undergraduate skills and knowledge.

The Foundation Year textbooks used for this review were from courses that had been approved by the ACC. The findings from this research must then also raise questions about the standards that have been developed and applied in the approval processes for university Foundation Year courses. Questions about whether the ACC standards themselves are in need of review and development or if there are better alternate mechanisms that may be implemented to monitor course quality must also be addressed.

VI.2 Limitations of the Study

There are some clear and obvious limitations to this study. The limited number of Foundation Year textbooks we were able to gain access to has meant that our review of the textbooks has been limited to five universities which may not be representative of most Cambodian university Foundation Year programs.

Furthermore, using the perceptions of individuals relies on their accuracy of recall, and their ability to reflect and analyse their own experiences. Nevertheless such perceptions should not be casually dismissed. The perceptions of a person are 'the truth' as experienced and understood by the individual and they can provide important indicators for institutions and policy makers who are seeking a wide collection of evidence on which to develop plans and policies. Whilst perceptions can be an important source of evidence, such evidence is limited for the reasons outlined above and, as such, needs to be supplemented by data from other sources especially if an argument for change or development is being presented. In this study the perceptions of those who participated in the survey and the phone interviews has provided rich detail, the reviewers assessment of the textbooks has provided another important and different source of data.

It is unknown what value may have been gained from interviewing the high school textbook developers but it may have provided a source of material that is currently not included in the study.

This study has not included an analysis or discussion of the traditional Cambodian views of learning and knowledge, and the possible impact of those views on the learning that occurs in classrooms. Such a discussion may provide another important lens through which to explore the findings of this study. For example, the traditional Cambodian view of knowledge that meant questioning of a teacher and the material being presented was considered disrespectful may be one important cultural belief that subtly acts on the teaching and learning behaviour of students and teachers in Cambodian schools. It has been well established in the international literature, for example, that teachers' beliefs about teaching and learning are a significant influence on teachers' classroom behaviours. This example raises a number of questions in the Cambodian context. How might traditional and deeply held views of learning and knowledge, the role of the teacher and the role of the student affect classroom practices in the use of textbooks? Would textbooks that teach critical thinking and inquiry skills be used effectively by Cambodian teachers? Can the dramatic penetration of ICT (basic

mobile phones but also smartphones and tablets) in Cambodia in recent years along with the significant adoption of online social media be interpreted as signs of *cultural and cross-generational shifts* in the society with regard to patterns and purposes of knowledge-sharing[8]? If so, how can textbook formats be adapted to also embrace such a cultural shift?

VI.3 Recommendations for Further Study

In view of the limitations described above, an extensive review of all prescribed primary, secondary and high school, and Foundation Year textbooks is needed across Cambodia. The adoption of a framework similar to the one used in this study would produce important detail about the quality and depth of content being covered as well as the types of thinking skills being developed.

Interviewing people involved in textbook development, at both high school and Foundation Year levels, would provide valuable information on the decision making processes involved in the selection of material included and excluded from textbooks. It would also be valuable to explore the textbook developers' understanding of the competing forces that they may face in the development of textbooks in a country with a population that has low incomes and without a strong 'culture of reading'.

It could be useful to explore alternative learning formats that may be available for teaching and learning of subject content that could be used by Cambodian teachers and students, for example, the use of computer technology rather than printed textbooks. This might mean, for example, that textbooks in digital formats could be updated, refreshed, and distributed more easily and quickly, and incorporate teaching approaches that accommodate a broader range of learning approaches. For instance, students with a learning style that learns better through sound and images (rather than the static format of printed books) could be better catered for. It would also require students to gain proficiency in the use of technology like computers, a skill identified as being needed in the contemporary workforce. Reviewing what is being done in neighbouring developing countries would be a useful first start in a project such as this.

[8] External initiatives such as USAID-funded "Social Innovation Lab Kampuchea (SILK)" — whose aim is to facilitate the growth of Cambodia-made ICT that supports civic engagement and participation (DAI, 2013)— implicitly rely on the same assumption of a cultural shift, *emphasizing the use of innovative ICT for the purpose of transformative knowledge-sharing*.

It would also be worth exploring further the patterns of uptake of mobile technologies and social media throughout Cambodian society, especially by the younger generation. Should such patterns prove persistent, important policy implications could evolve, for example, establishing the missing link between the official textbook-based body of knowledge on the one hand, and the organically-growing online body of knowledge on the other hand.

VI.4 Policy Implications

Two broad policy implications can be drawn from this study related to upper secondary school curriculum on the one hand, and Foundation Year programs on the other.

VI.4.1 Upper Secondary Curriculum

Drawing from the findings and analysis presented in the main body of this report, *skills* appear as pivotal *factors in employability*. Policy implications follow, and these will be successively addressed below under the headings of *employability skills, hard skills*, *soft skills*, and *life-long learning skills*.

Employability skills

The answer to the challenge of preparing the labour force to be employable and productive will vary across countries; there is no 'one-size-fits-all' response. The analytical and measurement tools to diagnose gaps and problems do currently exist. There is a growing body of evidence on effective approaches to skills development that can help inform policy-making — with the necessary adaptation to local conditions. Information on skill gaps and program performance can play a transformative role in supporting evidence-based policy innovation as well as creating awareness and demand for change.

Hard skills

In the context of this report, hard skills refer to both specific technical and vocational skills as well as basic knowledge from core subjects such as *mathematics*, *science* and *social studies*. Even though the four elective vocational courses, *ITC/technology*, *Accounting/business*, *Tourism*, and *Art education* mentioned in the intended curriculum policy (2005-2009) are relevant skills from the point of view of the current needs of the labour market, in actual practice, these skills are not taught due, in part, to the absence of textbooks. It is suggested that this situation be addressed and remedied.

It is anticipated that the Cambodian economy's structure in general, and local labour markets in particular, will evolve rapidly over the next few years as the result of the growing influence of economic linkages at the regional level. Therefore it will become increasingly important to ensure that elective vocational skill programs actually respond to *local* labour market needs. The ability for school principals and other education professionals with curriculum development competencies to have access to information on labour market trends will help them make informed decisions as how to adapt the teaching of elective programs.

The current policy states that students will gain high levels of knowledge and skills from their studies. Analysis of textbook content at the upper secondary level, especially in the mathematics and science subjects has raised a number of questions about the quality and accuracy of material offered. There is a need for the policy to have clearly stated learning objectives or outcomes for each grade level in each subject area which will shape the development of textbooks and other learning materials used in the classroom so that students can master the knowledge and skills in the core subjects.

Soft skills

The current policy makes several explicit statements about soft skill development among students. Analysis of the Cambodian upper secondary textbooks found that the curriculum policy aims and goals in terms of the development of a student's soft employability skills are generally not realised in the materials produced for use by teacher and students. The current textbook and teaching methods fail to adequately equip students with a wide range of soft skills such as: an understanding of and positive attitudes towards employment; the capacity to exercise judgment, critical thinking, communication, and engage in team work; the requisite skills for identifying, analysing and working towards solutions of problems.

The obligation for an education system to develop individuals with these wide range of soft skills as well as hard skills mentioned earlier requires a significant revision of both the subject offerings and the textbooks that are the core resources for learning in the classroom as well as the way teachers are prepared to teach.

Life-long learning skills

The range of subjects prescribed in the current policy raise the real issue of surface learning. Requiring a broad range of subjects to be studied at the senior levels of high school

prevents students from focusing deeply in one or two areas of interest. Such a curriculum-oriented approach to pedagogy encourages learners to adopt a *surface learning strategy*, skimming through the content rather than developing deeper levels of understanding and application. A balance should be preserved so that students acquire solid foundations in humanities and sciences during early years of learning, then subsequently focus deeply on fewer areas of interest during higher-grade years. Such a progression is more likely to help equip graduates with skills and attitudes that will prepare them well for lifelong learning.

The textbooks currently in use are aimed at learning at the lower levels of thinking. In order to remedy that situation, the policy should identify a shift in emphasis from primarily content-focused teaching to *balanced content-focused* and *process-focused teaching*. It will require further capacity building to strengthen teachers' pedagogy, especially teachers' understanding of the philosophical foundations of pedagogy. It also requires combining the capability for current teachers to identify *in-service* opportunities for learning process-focused approaches to teaching with *pre-service* curriculum development.

Among all essential life-long learning skills, *digital literacy* is identified as a particularly high-priority. Neuroscience research suggests that the exposure to digital technology should be initiated during teenage years i.e. typically grade 10-11-12 years. Therefore it is suggested that the policy should: (a) Review the curriculum of the current ICT elective vocational subject; (b) Identify pedagogic content that helps students build transferable digital literacy skills; (c) Shift that portion of the pedagogic content to the core curriculum in lower secondary grades. The policy should also state precise learning objectives or outcomes such as: (a) the attainment of effective online searching skills; (b) a developed ability to use specific soft skills for online collaboration where team players combine complementary skills such as *administration of online collaboration spaces, production of original content*, as well as *participation to online discussions and production of relevant comments*; (c) the ability to recognise copyrighted material and reuse it appropriately.

The question then arises how to *build specific teaching capacity* for digital literacy classes so as to assess and produce desired learning outcomes. The policy may wish to emphasize the *experiential* and *collaborative dimensions of learning* through encouraging the use of students' own I.T. devices (e.g. *smartphones*) as support for digital literacy classes, and by inviting the use of such devices on a collaborative basis. Investments in I.T. equipment for the specific purpose of digital literacy development would then be confined to the teachers'

own equipment. In addition, the policy should identify a *specific teacher-training program* designed to transfer the needed competences to teachers, so that they are able to assess the outcomes of digital literacy classes.

An opportunity exists to link textbook topics with the broader space of online knowledge sharing. It may be implemented in a simple manner, by creating "online topical anchors" i.e.: (a) Creating *online topical pages* (e.g. wiki-style pages) for each and every topic that is part of the intended curriculum; (b) Systematising the insertion of URL references[9] to such online topical pages, that would be printed at the end or beginning of each subject textbook for readers to type into their web-browser. Management of, and content development for such online topical pages ought to be ruled by policy guidance.

More generally, the policy should *encourage the further combining of relevant online knowledge resources* in relation to textbook content on a subject-by-subject basis. Such combining is expected to happen as the result of a multi-stakeholder interaction between *teachers, employers, students* and *graduates*. It can and should be influenced by policy directions in terms of: (a) promoting the initiative; (b) discovering third-party knowledge bases; (c) referencing, labelling, and endorsing third-party knowledge assets. Once in place, teachers, employers, and especially students would be presented with an online "knowledge continuum". The policy should also encourage students and graduates to increasingly develop a habit and culture of digging into that knowledge continuum, thereby developing *authentic learning skills* and *life-long learning skills* at the same time.

Finally, the policy should also aim at *developing information literacy and mastery for teachers,* through specific teacher training programmes, thereby *adding to teachers' own life-long learning skills*. A first outcome would be the ability for teachers to supervise information literacy classes, assess progress, and provide guidance to some extent. Another outcome would be an increase in the ability of teachers to engage in online knowledge-sharing with peers for sharing pedagogic insights in general and evaluating textbooks (while they are being used)[10] in particular. Teachers could engage in online knowledge-sharing with external stakeholders such as *school principals, local employers, local business associations,* and *graduates*

[9] For example, as human-readable URLs and/or computer-readable matrix barcodes ("QR-codes")

[10] The cycle for textbook evaluation has been conceptualised to comprise of three significant stages: (a) *pre-use*; (b) *whilst-in-use* (Mukundan et al., 2011); and (c) *post-use* (Laurence, 2012).

for the purpose of post-use evaluation [11] of textbooks. Overall, the ability to combine insights regarding textbook content (whilst-in-use and post-use) using online knowledge management technologies would provide pedagogic experts with enriched information while revising textbooks, thereby contributing to the effectiveness of further curriculum and textbook revision cycles.

VI.4.2 Foundation Year

From the limited number of textbooks used in this review, the reviewers uncovered an uneven quality in terms of content as well as approaches to learning. The Foundation Year textbooks used for this review were from courses that had been approved by the ACC. The findings from this research must then also raise questions about the standards that have been developed and applied to approve university Foundation Year courses and whether the ACC standards themselves are in need of review and development. This also raises the questions as to whether better mechanisms could be implemented to monitor course quality and whether the concept of a Foundation Year itself needs review.

[11] use of textbook content at workplace or in the community

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