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Data for Education Programming in Asia and the Middle East (DEP/AME)

Lower Mekong Workforce Skills Gap Analysis and Implications for Regional Economic Growth

EdData II Technical and Managerial Assistance

Task Number 15

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Table of Contents

List of Figures

List of Tables

Preface

RTI International managed the Lower Mekong Study, which was truly a team effort, led by two experienced consultants. Hayley Alexander focused on the private sector within the workforce development process among the selected countries, while David Feige focused on the educational institution side. They were the main survey designers, interviewers, and authors; their expertise informed the study, the findings, and the key recommendations and their backgrounds provide insight into the lens brought to the interpretation of the data collected.

Mr. Alexander is an economic growth expert with 30 years of experience working with small and medium enterprises (SMEs), business development service (BDS) providers, governments, and academia in eleven emerging markets. This includes 10 years working in an American SME, 18 years consulting to SMEs and BDS providers on long-term assignments in Eastern Europe and Africa, and three years as an independent consultant on short-term activities. Mr. Alexander's broad United States Agency for International Development (USAID) and World Bank project experience include program design and start-up, technical direction, management, grant programs, monitoring and evaluation, consulting/training, and project closure. His areas of technical competency encompass institution building, BDS capacity enhancement, export development, policy and regulatory reform, and other competitiveness strengthening activities in multiple industry sectors. He has performed numerous assessments and studies to identify value chain linkage failures and market constraints, and the pathways to reengineering with BDS and other cluster members.

Mr. Feige is an economic growth and workforce specialist with 15 years of experience in international economic development. He has expertise in workforce development, competitiveness, value chain development, regional economic development, entrepreneurship and enterprise development, and technology-led economic development. In his most recent assignment, he conducted a desk review and provided input on the project approval document for youth and workforce elements for the USAID/Nigeria Mission. Prior to becoming an independent consultant, Mr. Feige was a Director at Making Cents International, where he conducted technical assignments on economic growth projects with a particular focus on youth-inclusive economic development and youth economic empowerment. Before joining Making Cents, Mr. Feige worked for nearly 5 years for J.E. Austin Associates, a specialized economic development consultancy, where he conducted a wide variety of technical assignments in Asia, Middle East, Latin America, Eastern Europe, and Africa. This included development of an enterprise diagnostic that equipped USAID missions to evaluate enterprise-level performance in response to changes in the enabling environment, training of new USAID economic growth officers in Thailand, and a survey of effective approaches to supporting high-growth entrepreneurship in developing countries.

The consultants worked under the guidance of RTI's Workforce and Economic Opportunities team, comprised of Eric Johnson, Senior Research Economist, and Julie Lostumbo, Senior Economic Development Specialist.

Abbreviations

ABET	Accreditation Board for Engineering and Technology
AEC	ASEAN economic community
ASEAN	Association of Southeast Asian Nations
BDS	business development service
BOI	(Thailand) Board of Investment
CAD	computer-aided design
CAM	computer-aided manufacturing
CFTC	common facility training center
CPE	continuing professional education
COMET	Connecting the Mekong through Education and Training
CRDI	Cambodia Resource Development Institute
CV	curriculum vitae
DEP/AME	Data for Education Programming in Asia/Middle East
EdData II	USAID Education Data for Decision Making II
EI	educational institution(s)
F&B	food & beverage
FDI	foreign direct investment
GDP	gross domestic product
GVC	global value chain
HCMC	Ho Chi Minh City
HR	human resource
IC	integrated circuit
IOT	Internet of Things
IP	intellectual property
ISO	International Organization for Standardization
IT	information technology
JICA	Japan International Cooperation Agency
KSA	knowledge, skill, and ability
LMA	labor market assessment
MBA	master of business administration
MNC	multinational corporation
MOT	(Thai) Ministry of Tourism
MRA-TP	Mutual Recognition Arrangement on Tourism Professionals
NEA	(Cambodian) National Employment Agency
NECTEC	(Thailand) National Electronics and Computer Technology Center
NGO	nongovernmental organization
NSTDA	(Thai) National Science and Technology Development Agency
ODM	original design manufacturing
OEM	original equipment manufacturing

R&D	research and development
RTI	RTI International
SEZ	special economic zone
SPC	statistical process control
STEM+AT	science, technology, engineering, mathematics, accounting, and tourism
TOT	training of trainers
TTCI	Travel & Tourism Competitiveness Index
TVET	technical vocational education and training
USAID	United States Agency for International Development
VC	value chain
WFD	workforce development

Executive Summary

This report, commissioned by the United States Agency for International Development (USAID) through the Education Data for Decision Making (EdData) II Program, focuses on ways educational institutions in the tourism and electronics sectors in the Lower Mekong region can better meet private-sector demand and increase the employability of youth. It is designed to provide context and further detail to the labor market assessments (LMA) produced under the USAID Connecting the Mekong through Education and Training (COMET) program. The study was conducted from March to May 2016, with on-the-ground interviews of over 70 Lower Mekong employers and education institutions, as well as significant literature review.

The backdrop to this study is a rapidly integrating Association of Southeast Asian Nations (ASEAN) region, a process that has been accelerated by the recent ASEAN Economic Community (AEC) agreement, which embraces the regional mobility of skills and free flow of workers. With this comes opportunity for businesses as they gain access to a wider pool of skilled labor, but greater challenges for graduates as they enter an increasingly competitive labor market. This report attempts to contextualize workforce needs, and the skills development system, within this broader picture. Tourism and electronics were selected as sector foci due to their economic importance to the three Lower Mekong countries featured in this report, Cambodia, Thailand, and Vietnam.

In tourism, the single most-significant regional development is the Mutual Recognition Arrangement on Tourism Professionals (MRA-TP) agreement, which will increase the mobility of labor within the ASEAN region by establishing a single set of knowledge, skills, and abilities (KSAs) requirements related to each of 32 specific jobs. This should be an economic boon for the region as a whole, permitting better matching of skills with jobs than is currently possible, while tourism-related businesses should benefit from a wider pool of talent. However, laborers in each country will not all benefit equally: workers with access to more sophisticated training systems will likely be able to achieve the skills standards more quickly than those with less-sophisticated ones.

Furthermore, workers with language skills will be more mobile than those without them. Thus, workers with greater English facility, such as those from Singapore, Laos, and the Philippines, will naturally be more mobile than those from other countries, and more-skilled workers, such as those from Singapore and Malaysia, will benefit from greater opportunities at the expense of less-skilled ones. This impact is likely to be twofold: more foreign workers are expected to migrate to the Mekong, creating more competition for the top jobs there, while tourism workers from these countries will face challenges in taking their skills elsewhere.

The educational systems in Cambodia, Thailand, and Vietnam are, on the whole, ill-prepared to help tourism graduates confront these challenges. Although a few tourism programs are actually quite strong, the overall quality is uneven, and they are insufficient to satisfy the exploding demand. Tourism enterprises rely heavily on in-house training programs due to the inadequate applied skills of graduates. Because businesses assume that re-training will be necessary, they tend to emphasize attitude and perceived trainability of graduates over their degree. This

generally favors technical vocational education and training (TVET) graduates over university degree holders who often have unrealistic expectations with respect to their role (as well as salary). Misperceptions on the part of university tourism graduates—that they will be stepping immediately into supervisory roles—are reinforced by schools themselves, which insist they are training students to be managers, not front-line employees.

Tourism educational institutions also struggle to equip graduates with multidisciplinary knowledge and skills. This deficiency plays an important role in determining the three positions most commonly identified by tourism enterprises as difficult to find: middle managers, sales or marketing professionals, and upper-level managers. Furthermore, soft skills in decision making, teamwork, leadership, and communication are lacking. Of equal concern are insufficient language skills (especially English, but also languages of emerging importance such as Mandarin and Russian) and the inability of graduates to use applied technologies such as Amadeus, an online booking system frequently employed in the airline industry.

In electronics, we found a strikingly similar lack of value addition in the three countries. While Thailand and Vietnam are clearly ahead of Cambodia in this regard, none of the three countries is actively engaged in the higher-level electronics design work that characterizes countries at the higher end of the electronics value chain. Components are assembled into hard drives and other accessories, mainly from imported subcomponents, all of which were designed and prototyped elsewhere. First-tier suppliers for the large multinational corporations (MNCs), such as Seagate, remain mainly composed of other internationally owned companies that simply follow lead firms around the world, setting up nearby subassembly operations. Virtually no domestically owned companies exist in any of these Lower Mekong countries that directly manufacture subcomponents for the electronics industry. Those that do exist simply produce others' intellectual property (IP) for them.

Escaping from this trap involves taking on more value-adding processes ranging from design to prototyping to quality testing. The existing margins for basic assembly have decreased to near 2%, whereas the margins for design are closer to 30%; the incentive to upscale is therefore clear. The problem is the lack of experienced and qualified people to handle such operations—workers not currently being produced by the educational system. Instead, a vicious circle has emerged whereby educational institutions produce skilled technicians instead of engineers because of a clear preference for those profiles by employers, while the industry will not evolve into higher-level functions without the presence of more design engineers. Critically, because of the natural tendency toward higher wages, countries must move up the electronics value chain or out. As basic functions become more expensive, MNCs will gravitate toward lower-cost locations.

As with tourism programs, electronics education has similarly struggled to support industry's move up the value chain, thereby playing its part in creating an insufficient number of interesting opportunities for graduates. Shortcomings by educational institutions in developing multidisciplinary skill sets have contributed to the inability of businesses to locate talent such as front office managers, production managers, and marketing/sales people, suggesting that the "specialist" graduate engineering graduates produced by the educational system may in fact be overly specialized.

At the same time, many graduates also lack the applied skills necessary for their success; although courses in statistics and probability, material/metallurgical properties, physics, chemistry, and other sciences are required parts of the curriculum, many new graduates still lack applied knowledge in these areas. This can be traced back to the only limited use of hands-on software such as simulations at the university level, and only erratic access to the latest technologies (such as computer-aided design and manufacturing [CAD/CAM] equipment) in TVETs. As with tourism, soft skills development is a problem; leadership, people skills, the ability to constructively challenge authority, and problem solving were most often identified. The latter—lack of problem solving skills—is particularly constraining in a sector such as electronics where problem solving and creativity drive innovation, which in turn, drives growth.

In both tourism and electronics we found a complete lack of confidence by industry in university and vocational career placement centers. In tourism firms this dynamic has manifested itself in only limited contact between the companies and the educational institutions, while in electronics employers have resorted to establishing relationships with specific faculty in academic departments of interest and carrying recruiting out through them. Other shortcomings were identified with respect to the lack of a systemic relationship between educational institutions and businesses, including a resistance by educational institutions to updating curricula, the limited to non-existent role of the private sector in the curriculum development process, and limited interaction between faculty and private enterprises. From the private sector's perspective, the perceived strength of linkages with TVETs versus linkages with universities was clearly more dependent on the assertiveness of individual institutions themselves than whether they fall into the category of a university or TVET. In fact, the only clear correlation involved tourism firms generally citing stronger linkages with TVETs while electronics firms more often spoke of better linkages with universities.

In general, though, the relationship between educational institutions and the private sector can be characterized as ad hoc and unsystematic. This can be attributed to both educational institutions, which have often been lacking in their attempts to reach out to enterprises, and the private sector, which is also partly responsible due to insufficient coordination in speaking with a single voice to articulate its talent needs. In addition, while internships are generally encouraged (particularly in Thailand and Vietnam), little assistance is provided to students in finding them. Instead, students rely heavily on their own networks or those of their professors. The content of internships was also called into question, with many interviewees questioning the quality of the experience interns are receiving. Interestingly, in electronics we found that universities and TVETs play largely complementary roles in skills development, with TVETs training lower-level assembly workers while universities trained technicians and, to a very limited extent, design engineers. However, in tourism both universities and TVETs are producing graduates that are competing for the same jobs—a reality that is recognized by TVETs but not by universities.

Addressing these challenges will require changes in the way that educational institutions engage with enterprises. We have identified several of these "touch points" where the relationship between enterprises and educational institutions can be strengthened to the mutual benefit of

both. Fortunately, a number of best practices are already being employed by some of the region's educational institutions. These practices are highlighted in *Figure ES-1*.

Figure ES-1. Best Practices of Regional Educational Institutions

Touch Point	Key Activities (current state)	Key Activities (ideal state)	Examples
CURRICULUM	Curriculum only infrequently incorporates industry involvement	Annual curriculum reviews with private sector partners	One school engages in annual curriculum reviews with select private sector partners
	Static curricula not oriented toward future industry needs	Develop new forward-looking programs as industry changes	One electronics school offers a multinational corporation-designed elective specific to its firm
FACULTY	Most university professors lack any industry experience at all; TVETs tend to have more faculty with work experience	Hire faculty with industry experience	One tourism school exclusively hires faculty with private sector experience, then "teaches them to teach"
	Faculty externships nearly non-existent	Provide faculty with externships in industry	One engineering school provides 3-month stints on site with industry for learning purposes, during which professors are paid their full salary and have reduced teaching responsibilities
	Irregular use of guest lecturers in Thailand and Vietnam; uncommon use in Cambodia	Invite guest lecturers from industry partners regularly (2+ times per semester)	Multiple schools use guest lecturers 2–3 times per semester in application-oriented classes

Touch Point	Key Activities (current state)	Key Activities (ideal state)	Examples
LEARNING	Work-based learning is the exception rather than the rule and often dependent on school's resources	Work-based learning opportunities built into curriculum, especially those that provide hands-on experience	One TVET uses mock-ups of hotels of common 5-star hotel chains; a university has a mocked-up airplane; another TVET had a fully equipped kitchen; and multiple engineering programs use simulations to enhance the learning experience
	Design competitions are rare	Industry sponsored projects/prizes used to inspire creativity	One university supports students participating in the World Skill Competition, while another sponsors design challenges to encourage its most-talented students to express their creative side
	Internships common in Thailand and Vietnam (although of questionable quality) and uncommon in Cambodia	Required and facilitated internships	One university provides rotational internships of 3 months each annually in different industry functions, while another uses its in-house hotel establishment to provide students with assignments that rotate every 3 weeks

Touch Point	Key Activities (current state)	Key Activities (ideal state)	Examples
PLACEMENT /HIRING	Almost no tracking of graduates	Annual alumni tracking and surveys	One school engages in regular tracking of alumni 1 year following graduation to find out where they work and how much they make, and to obtain feedback on their university experience
	Industry days successful where used but not universally employed	Industry days common across universities and TVETs	Multiple schools sponsored industry days with multiple employer or individual visits to campus by industry representatives
	Job fairs are common, but placement services offer little more than job postings, leaving students to find jobs through networks (often faculty members)	Direct hiring, job fairs, and placement services that offer both linkages to employers and soft-skill development	One school provides support not just with identification of job opportunities but also in soft-skill building, such as interviewing techniques and résumé development

An important emphasis of this report is the need for educational institutions to adapt on the fly to support rapidly changing private-sector needs, which are evolving more quickly as regional integration picks up pace. Therefore, we conclude by outlining critical future trends in each sector. In tourism, three industry trends emerged that will significantly impact the types of skills future tourism employees will require. First, the entire tourism distribution system is rapidly changing. Hotel, flight, and tour bookings are increasingly made online by travelers directly, and thus, the industry must develop sophisticated systems to keep pace, and employees must understand how to use them. Another trend is the increased need for Mandarin and Russian language skills, with both source markets now contributing substantially to international tourism arrivals. Indeed, China is now the largest source market. Finally, the rapid growth in tourism arrivals throughout the Lower Mekong region is generating its own set of challenges, particularly in large city markets, such as Bangkok, where new properties are being built monthly. This growth is creating a situation in which staff turnover is necessitating that existing employees be promoted more quickly than their experience levels may otherwise dictate.

In electronics, meanwhile, four key industry trends are important to highlight. First, original design manufacturing (ODM), in which original design is incorporated into domestically manufactured products, appears to be a viable way forward for Thailand and Vietnam. Engineers in Cambodia, Thailand, and Vietnam know how to efficiently assemble products but too often lack the physics, chemistry, and materials/properties knowledge to work further upstream in ODM. The second trend is precision manufacturing, which is growing rapidly as products become more automated and/or smaller. The long-term viability will depend on the increased availability of precision tool and die specialists and more skilled engineers/designers. The third trend is the internet of things (IOT), a catch-all phrase describing the connectivity of networked physical objects into smart phones and mobile platforms, allowing e-commerce, remote controlling, and even the monitoring of smart houses. This trend requires more skilled software engineers. Finally, the fourth major trend is the ever expanding field of automation for robotics and sensor-driven devices. Automation creates the need to integrate electronics engineering knowledge with mechanical engineering in, for example, the design of robots for manufacturing.

The report that follows explores these issues in greater depth in the Cambodia, Thailand, and Vietnam tourism and electronics sectors. Within each section, we attempt to bring out the differences within and between the included countries. Although the report limits itself to the aforementioned countries, findings have implications for other Lower Mekong countries as well, as shown in *Figure ES-2*.

Figure ES-2. Electronics and Tourism Profiles and Challenges

Electronics and Tourism Profiles and Challenges
Cambodia, Thailand, and Vietnam

Thailand

Electronics

- **$50 billion exports** per year since 2010 (largest of the three countries), now **25% of total exports**
- Globally integrated with largest buyers: USA, ASEAN, Hong Kong, Japan, and China
- Successfully transitioning from hard drives to **integrated circuits and RFID**
- **8-year tax exemptions and reduced duties**—most proactive government support
- Well-developed cluster infrastructure

Tourism

- **2nd only to China** regionally in tourism receipts and **10th in world**
- **Region's hub** and poised for leadership in destination management
- Active **across-border tourism** initiatives with Cambodia, Myanmar, and Philippines
- Supportive government initiatives: new **6-month visa**
- Most mature and diverse product lines of the three countries

Cambodia

Electronics

- **200% export growth** since 2010
- Geographic advantage—centered between Thailand and Vietnam with ocean ports
- Very low cost, young labor pool
- Domestic electronics market **growing at 10–15%** annually—interest to FDI manufacturers

Tourism

- **5 million tourists** in 2015, from 290,000 in 1998
- Contributes **10% of GDP** now
- Major impact on balance of payments, FDI, and secondary sector growth, e.g., agriculture
- Growing economic, cultural, beach, even casino tourism subsector offerings

Vietnam

Electronics

- **Exports nearly doubled** since 2011
- **98%+** FDI driving growth
- Population of 92 million (largest of the three)—**strong domestic market**
- **Manufacturing niche** for mobile phones, printers, and copiers
- Labor productivity increasing by nearly 6% annually

Tourism

- **8 million tourists** per year, doubled since 2005
- Tourism just under **10% of GDP**, government recognition rising
- Government showing vision—leading the development of a **regional World Heritage route**
- Diverse product offering with ecological, post-war, cultural, island/beach, adventure tourism

THAILAND

Bangkok

CAMBODIA

Phnom Penh

VIETNAM

● **Ho Chi Minh**

Regional Challenges

Electronics

- Over 90% of growth driven by FDI (not domestic firms)
- FDI firms bring their own base of suppliers with them
- Workforce needs basic literacy and numeracy
- FDI harder to attract with minimally skilled labor
- Rapidly growing labor costs, especially in Thailand
- Over 85% of export value is made up of materials imports (domestic contribution may be just packaging)
- Vicious circle—few skilled engineering graduates for even fewer jobs until industry advances in value chain

Tourism

- Vietnam and Cambodia held back by infrastructure, accommodation, and customer service issues; Thailand by setbacks in instability and safety
- Industry built on pillars of being exotic (unknown) and low cost; neither is a secure base for future growth
- Over-reliance on bargain travel market, which masks problems with industry professionalism and customer service
- Increasing problems with fraud, especially in Thailand
- Low industry perception of tourism degrees and certificates

ASEAN: Association of Southeast Asian Nations; FDI: foreign direct investment; GDP: gross domestic product; RFID: radio frequency identification
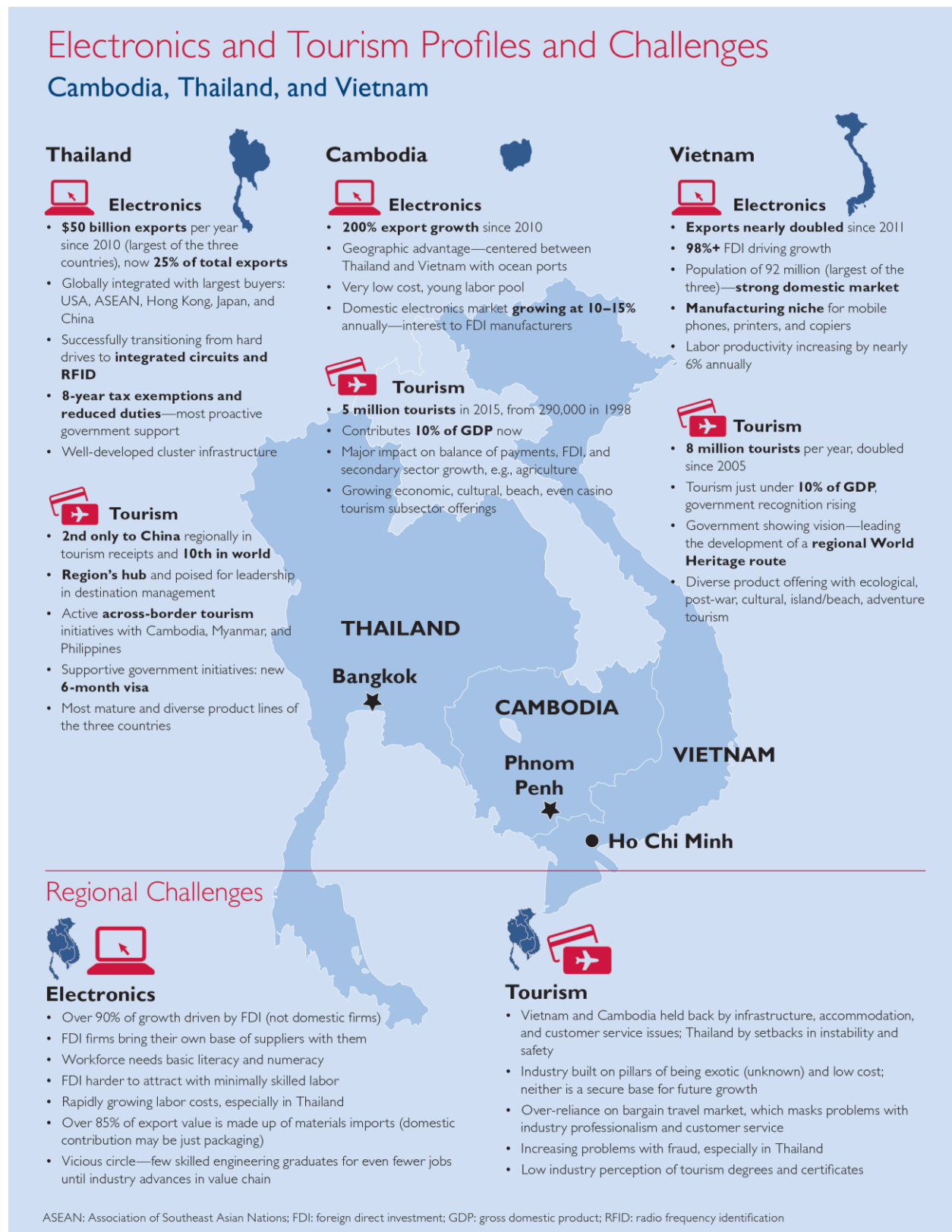
Figure ES-3 presents a summary of key study recommendations organized into four broad categories. Details and contextual information pertaining to implementation are provided in the final section of this report.

Figure ES-3. Summary of Key Recommendations

Summary Recommendations	Key Success Factors
Overarching Recommendations for Educational Institutions (EIs)	
Model and disseminate good university and technical vocational education and training (TVET) practices by examples and study tours	• Receptive EI administrations • Applicable best practice role models & examples
Rebrand TVETs to alleviate their "second-rate institution" status – pilot then evaluate	• Ability to craft a believable message that resonates with youth and their families
Develop tracer studies to track graduates and assist in normalizing their use	• Receptive EI administrations
Recommendations to Enhance Curricula and Work Readiness	
Revise the curricula development process with increased private-sector input and more frequent reviews	• EI willingness to reach out to the private sector • Industry readiness to engage with singular voice • Receptive EI administrations
Facilitate the incorporation of technology and classroom simulation in keeping with industry trends	• Adequate funding streams • In-depth understanding of core trends • Receptive EI administrations
Further emphasize soft skills development via interactive exercises and competitions	• In-depth understanding of soft skills needs • Receptive EI administrations
Develop an orientation toward multidisciplinary skill sets, e.g., technical combined with managerial and marketing	• In-depth understanding of logical multidisciplinary skills needs • Receptive EI administrations
Improve flexibility and incentives that enable students to take courses across multiple departments	• In-depth understanding of logical multidisciplinary skills needs • Receptive EI administrations
Tourism specific curricula recommendations: **a) Focus on key sector needs – supervision, strategic analysis, financial analysis** **b) Higher-level language training – especially English, Mandarin, Russian** **c) Engage in current technology training – booking systems, e-commerce, e-marketing**	• Active use of systematic EI/industry fora • Receptive EI administrations
Electronics specific curricula recommendations: **a) Focus on applied engineering sciences – statistics, physics, metallurgy, and practical ways of learning, e.g., robotics competitions** **b) Upgrade to reflect world standards/trends –** **original design manufacturing (ODM), precision manufacturing, internet of things (IOT) and automation** **c) Increase teamwork for improved integrated knowledge and soft skills**	• Active use of systematic EI / industry fora • Receptive EI administrations
Recommendations to Strengthen Overall EI and Private-Sector Coordination	
EIs seek industry buy-in to prioritize and develop continuing professional education (CPE) programs	• Industry belief in CPE value (worth paying for) • Receptive EI administrations
Facilitate the development of common facility training centers (CFTCs) through multiple EI and industry stakeholder partnerships	• Industry readiness to engage with EIs toward a perceived valuable outcome • Receptive EI administrations
Systematically leverage industry assistance through structured industry-EI liaison platforms that enable collaboration	• Active use of systematic EI / industry fora • Receptive EI administrations • Industry readiness to engage with EIs toward a perceived valuable outcome • Strengthened industry associations
Survey industry training costs, which could be reduced if graduates were more skilled, then seek to channel private-sector funding into EI curricula	• Industry readiness to engage with EIs toward a perceived valuable outcome • Involvement of industry associations with adequate capacity for surveying • Receptive EI administrations
Build capacity in private sector associations with capable management teams, include EI representatives then work to bridge EI/industry gap	• Presence of industry associations with adequate capacity to build upon • Willingness of EIs to partake in association activities
Related to previous, help establish a singular industry voice to better articulate needs for graduates, both existing and foreseen	• Presence of industry associations with adequate capacity to build upon • Industry willingness to engage with a cluster mentality
Inform and educate the private sector about internship best practices to improve the student learning experience (and their own)	• Industry readiness to engage with EIs toward a perceived valuable outcome
Recommendations Specific to Gender Diversity	
Raise science, technology, engineering, and mathematics awareness among women through internal EI programs, particularly in electronics, to increase skilled female graduates	• Ability to influence and measure acceptance at student and societal levels • Receptive EI administrations

Summary Recommendations	Key Success Factors
Assist to incorporate university-level course modules that underscore the need for and benefits of gender diversity	• Availability of existing relevant modules • Receptive EI administrations
Develop a public awareness campaign targeted to employers in key industries to shed light on the need for increased gender diversity	• Ability to craft a message that succinctly defines the benefits to industry and society

1   Background and Methods

The United States Agency for International Development- (USAID-) funded Connecting the Mekong through Education and Training (COMET) project focuses on helping universities and vocational centers increase skills in science, technology, engineering, mathematics, accounting, and tourism (STEM+AT) to produce a better-skilled workforce in the Lower Mekong. COMET has the critical task of linking STEM+AT training and graduates to economic sectors within regional value chains (VCs) that have growth and job creation opportunities.

COMET annually produces a regional labor market assessment (LMA) that identifies priority economic sectors, labor market trends, and occupations incorporating STEM+AT. The 2016 LMA provides a comprehensive picture, with key findings including updates on the priority sectors, on the continued gender imbalance in the workforce across sectors, and on the requirement by employers that job candidates have a strong combination of English language and computer skills along with soft and technical skills.

To provide support to COMET and provide context and granularity to its LMA, RTI International (RTI), through the USAID Education Data for Decision Making (EdData) II program, conducted a study of Lower Mekong employer skill needs and educational program response, focusing on ways education institutions could better meet private-sector demand and increase the employability of youth. This report explores these issues in the Cambodia, Thailand, and Vietnam tourism and electronics sectors—though findings have implications for other Lower Mekong countries and sectors as well. The report is divided into two sections corresponding to the two target sectors (electronics and tourism). Within each section, we attempt to bring out the differences within and between the included countries.

With this study, we aspire to answer the following questions:

- *What are the changing needs for skilled technical and managerial employees as the tourism and electronics sectors evolve in each country?*

- *How can educational and training institutes help students build the skills required for the "up-skilling" of each sector necessary to enhance employability for graduates, who must compete with an increasingly Association of Southeast Asian Nations (ASEAN)-wide labor pool in these sectors?*

Whereas the first question concerns itself with the evolving skill needs associated with specific jobs, the second introduces the idea of regional competition for those jobs. Thus, we add elements of temporal and regional dynamics, as well as further depth, to the good work done under the COMET LMA.

Methodology

The primary study authors (see preface for more information) conducted interviews with 34 universities and technical vocational education and training (TVET) institutes and 33 private-sector actors in tourism and electronics in Thailand (Bangkok, Phuket, and Chiang Mai),

Vietnam (Ho Chi Minh City [HCMC] and Hanoi), and Cambodia (Phnom Penh and Siem Reap). Interviews took place from mid-April through late May of 2016, constituting more than 50 people–days on the ground in the region. In targeting interviewees, the objective was to obtain a broad representation of private-sector actors and types of educational institutions (EIs) that would provide sufficient information to be able to extrapolate about the situation in the countries as a whole. The interviewee sample was obtained through (1) COMET LMA respondent lists, (2) the hiring of a local consultant and use of the consultant's networks, and (3) references from one interviewee to another, or "snowballing." While our sample size limits statistical significance, we are confident that the data and views expressed broadly reflect a consensus about the situation as it is presented. The advantage to the interview format in contrast with COMET's earlier, highly data-oriented, survey is that it permitted engagement with education institutions and private-sector actors in more open-ended conversations, allowing for probing and follow-up questions to gain depth and context. While the conversations were guided by a set of questions, the questions were more qualitative in nature and allowed us to pursue specific threads of interest in each conversation (see the surveys used in *Annex B*; *Annex A* provides a list of interviewees). Throughout the text, we have tried to make clear where findings relate only to either universities or TVETs or where they apply to both groups of schools. In some cases, findings may be more robust for one group of EIs or the other depending on the number of interviews we were able to obtain; which was in turn often a function of the strength of that particular cohort of schools (for example, Thailand has a fairly weak vocational system relative to Vietnam, which provided more fertile ground for a more robust set of interviewees in the latter than in the former).

On the private-sector side, the survey included questions such as the following:

- Please indicate urgent and near-term hiring needs.

- With respect to your hiring needs, please identify your preferences for education and experience levels.

- What kinds of qualified managers are most difficult to find?

- What kinds of soft /interactive skills are most difficult to find in applicants/employees?

- What are some commonly used means to overcome skill gaps (such as on-the-job training, in-house or off-site short courses, or assisting employees to continue degree programs)?

- Are linkages to any EI beneficial to your company? If yes, indicate which (if any) of the following linkages with educational, technical, or vocational institutions you think would be beneficial to your company within the coming two years (such as internships and workplace-based learning, job fairs, career centers, or use of university or other training institution faculty for in-house or external training).

- What industry and product/service trends do you foresee, and how will they change your needs for skilled employees in the coming two years?

On the EI side, the survey included questions such as the following:

- To what extent do you view your mission as equipping students with practical, employable skills?

- Please describe the nature of private-sector involvement in curriculum development at your institution.

- Does your institution play a role in internships/apprenticeships? If yes, please describe the role of internships/apprenticeships in your program.

- Please rank order the top skills requirements of private-sector employers for your program's graduates.

- Please name the top five employers hiring graduates of your program.

- Do you ever use guest lecturers from the private sector? To what extent do existing faculty have private-sector experience?

- What are some of the trends you have seen in educational technology, and how do you envision them impacting either training delivery or placement of students?

In some cases the survey questions for the private sector and for the EIs mirrored one another, thereby enabling us to directly compare their responses.

In addition to this description of the approach taken to this report, it is also important to stress what it is *not*:

- *An LMA*. LMAs are important snapshots in time that aspire to identify specific skills in demand by the private sector. LMAs, such as those done by the COMET project over the past two years, can be enormously useful tools for conveying the state of private-sector needs to the educational sector. However, although this report contains elements of what might be characterized as an LMA, the primary focus is on the systemic elements relating to the supply–demand mismatch that adversely affects the ability of students to obtain good employment and makes it more difficult for the private sector to access the skilled workforce necessary for sustainable economic development. Where possible, we have referenced the COMET-conducted LMA findings within this report.

- *A comprehensive evaluation of the education sector in each of the countries*. Several excellent studies have been conducted that cover the university and/or TVET system in each country. These studies are detailed in the bibliography at the conclusion of the report and drawn on in the brief situation overview in Section 3.3. We targeted a group of institutions that are, collectively, representative of the skills development system in tourism and electronics specifically, rather than an evaluation of the skills development system as a whole.

- *An attempt to collect a statistically significant data set*. This report is not a research paper that seeks to draw statistically valid and broadly generalizable conclusions, but rather a qualitative "deep dive" into the Thai, Cambodian, and Vietnamese skills development systems in electronics and tourism. It aims to get beyond the identification of a skills

mismatch to a more nuanced sense of the elements and to a greater understanding of its root causes and generates specific recommendations about how it may be addressed. We have intentionally reduced breadth and statistical rigor to achieve qualitative depth.

2   Findings/Discussion

2.1   Overview of industry trends and regional dynamics shaping job markets

2.1.1   Secondary research summary findings: Electronics

Southeast Asian electronics sector overview

Global demand for electronics has risen steadily during the past five years at an annualized average exceeding 9%. This growth has been largely driven by the boom in consumer and durable electronics, which encompass everything from cell phones and personal music systems to computers and smart appliances. With Southeast Asian regional electronics exports currently growing at a healthy 13% annually, outstripping the international average, most analysts envision substantial market share increases as the integration of regional VCs intensifies and trade restrictions are lifted (Brown, 2015). These subsectors should only strengthen regionally as the recent completion of the ASEAN Economic Community (AEC) and Trans-Pacific Partnership promise to further expand Southeast Asia's share of global markets. Indeed, manufacturing and services are becoming increasingly important as agriculture, formerly the largest single industry in the region, diminishes in importance.

ASEAN – Highlights

Five core principles of the ASEAN single market and production base:

1. **Free flow of goods**
2. **Free flow of services**
3. **Free flow of investment**
4. **Free flow of capital**
5. **Free flow of skilled labor**

Four pillars of the AEC:

1. **Single Market and Production Base: The region as a whole must become a single market and production base to produce and commercialize goods and services throughout ASEAN.**
2. **Competitive Economic Region: The region must emphasize the competitiveness of its production and capacity for export and the free competition within its frontiers.**
3. **Equitable Economic Development: To receive the benefits of the AEC, the people and businesses of ASEAN must be engaged in the AEC's integration process.**
4. **Integration of ASEAN into the Global Economy: ASEAN must not be isolated. Instead, it must be an integrated part of the global economy.**

(ASEAN up, 2016)

As shown in *Figure 1*, the highest export growth among electronics subsectors in the ASEAN region remains in the low-value-added/low-capital-required segments, e.g., the production of insulated wire, as referenced in the bottom row under electric app[lication] for line telephony. Although this may have been a successful strategy in the past, it could allow new, low-cost, and low-skill countries to emerge and challenge Southeast Asia for relevant investments. As this report describes, the challenge facing this region is to continue offering a reasonably low-cost labor environment for manufacturing while upgrading its capacities to add more value to the exported end product.

Figure 1.   ASEAN Electronics Products

ASEAN Electronics Products						
		HS Code	Product label	Export Value 2014 (USD billion)	Share of Electronics Exports	Growth 2010-2014
Capital Input Required	High	8542	Integrated circuits & micro assemblies	140	47%	22%
		8523	Prepared unrecorded media	6.7	2%	-4%
	Medium	8541	Diodes / transistors & semiconductor devices	19	7%	-1%
		8536	Electrical app for switch (ex. fuse, switch, etc.)	7.8	3%	11%
		8525	Television camera, transmission app for radio-telephony	6.4	2%	17%
	Low	8517	Electric app for line telephony, incl. cut line systems	39	13%	221%
		8544	Insulated wire/cable	8.9	3%	52%
		8529	Part suitable for use with televisions, reception applications	6.4	2%	23%

Graphic© Asia Briefing Ltd.

Cambodian electronics sector overview

Cambodia has witnessed explosive growth in electronics, achieving export increases upwards of 200% since 2010 (International Trade Centre, 2016). This phenomenon has been largely driven by foreign direct investment (FDI), especially from Japanese manufacturers, taking advantage of special economic zones (SEZs) for electronics and automotive-related production. This trend is expected to continue because Sumitomo (a large electronics manufacturer) is constructing a plant in Cambodia that is due to begin operations in October of this year. Sumitomo asserts, *"Cambodia enjoys a geographical advantage, possessing logistical infrastructure and a plentiful supply of young, low-cost labor"* (Sumitomo Corporation, 2016). Furthermore, LG Electronics has identified Cambodia as the ASEAN market with the greatest potential for domestic-led growth, which is currently 10% to 15%. A growing domestic market often tips the balance when multinational corporations (MNCs) consider bases for new investment in production facilities, and Cambodia's expanding middle class is becoming increasingly attractive to them.

These developments, coupled with the spillover effect of manufacturing growth in Thailand, foretell continued strong potential for Cambodia's electronics sector. Nonetheless, as described by the Asian Development Bank, a key challenge remains: *"...the most important hurdle for Cambodia is an educational upgrade for its workforce... Most importantly, but most difficult, labor quality must be improved by investment in basic literacy and numeracy"* (De Carteret, 2016).

The evidence suggests that Cambodia will continue to experience growth in electronics production in the short to medium term, largely driven by low-cost labor, domestic market development, and reasonable, though not spectacular, infrastructure. As neighbors Thailand and Vietnam develop further, however, Cambodia will be forced to either upscale its workforce toward increased skill levels or remain at the poorer end of the low-cost labor range.

Thai electronics sector overview

Thailand's electronics sector is easily the largest of those of the three countries surveyed in both real terms and the percentage of gross domestic product (GDP). Annual exports have exceeded $50 billion since 2010, and by 2014, electronics exports accounted for nearly 25% of all exports (Thailand Board of Investment [BOI], 2015). With many of the largest electronics-producing and consuming countries as its key export markets (i.e., the USA, ASEAN, Hong Kong, Japan, and China, in that order), Thailand has effectively integrated itself as a key member of the global supply chain.

For a decade, Thailand was reliant on exports of hard drives, but since, it has transitioned heavily into solid-state componentry and integrated circuits (ICs). This transition will help ensure that its three- to five-year horizon remains strong. Radio frequency identification, a $10 billion global market that is growing fast, is also advancing rapidly in Thailand, with exports increasing annually.

In terms of support for sector-focused business development, Thailand's government is the most proactive of those of the three countries, and the creation of electronic clusters has been key to leveraging the capabilities of firms in the electronics industry. The proximity of firms and their input suppliers within the clusters has substantially improved production efficiency, which is important given Thailand's growing labor costs. Moreover, Thailand continues to aggressively seek additional investment by incentivizing FDI.

> **"Automation and Robotic industries will be granted super-cluster incentives, including an eight-year corporate income tax exemption, an additional five-year 50% reduction in tax plus import duty exemptions on machinery and raw materials. Interested investors must have cooperation with educational institutions, R&D centers, or Centers of Excellence and are to submit applications by December 31, 2016" (Thailand BOI, 2016).**

Thailand takes its status as the preeminent Lower Mekong electronics producer seriously, and generally, this country's industry is better coordinated and incentivized than those of other regional players. However, despite the positives, Thailand has hit a wall in the sense that it is close to reaching the extent of its ability to offer MNCs low-cost, moderately skilled labor for assembly only. Thus, it must begin adding more value as a manufacturing hub in its own right

and offer a workforce that is substantially more skilled relative to those of its regional competitors.

Vietnamese electronics sector overview

The Vietnamese electronics sector is more difficult to categorize than those of either Thailand or Cambodia, perhaps because it falls somewhere between the two in terms of size, maturity, and sophistication. The country itself is experiencing transformational growth, and its annual GDP gains are anticipated to reach 6.5–7% between 2016 and 2020. Electronics export growth in particular has been even more dramatic, expanding by more than 80% since 2011 (Nguyen, 2015). As for other countries in the region, however, this rapid expansion has been primarily driven by FDI from countries such as Samsung, Intel, LG, Panasonic, Sony, Canon, and Microsoft. In fact, in 2014, FDI accounted for 98.8% of all exported electronics, computers, and spare parts. One of Vietnam's FDI-attracting characteristics is, of course, low-cost labor, even in this region; indeed, it is ranked 8th lowest among ASEAN nations. This is changing, however, and incomes are beginning to rise (Vietnam Trade Promotion Agency [Vietrade], 2015).

Another attractive characteristic for FDI is Vietnam's domestic market for consumer electronics. With a population of 92 million, which is 40% higher than that of Thailand (67 million) and six times that of Cambodia (15 million), producers have access to a very large and expanding middle class of consumers. This fact alone will continue to ensure that Vietnam remains an attractive investment market for some time to come.

Previously, Vietnam's focus has been to act as a large processing and manufacturing hub for mobile phones, printers, and copiers. The downside of this strategy is, once again, the low value added occurring in Vietnamese production. By 2017, electronics exports are expected to exceed $40 billion; however, if current trends continue, material imports will consume nearly 90% of this value. The number of indigenous Vietnamese suppliers is very low for an industry of this size. Samsung reported having 90 component suppliers in Vietnam, of which only 10% were Vietnamese-owned firms. Additionally, those firms mainly offered low-value-added services, such as packaging and printing (Pham & Kumoro, 2016).

The longer-term sustainability of the industry will depend on whether Vietnam can continue to raise productivity and move up the VC. The influx of foreign electronics manufacturers has enabled the transfer of technology and skills, but this country needs to develop its own talent pool to sustain the trend:

> *Some companies appear keen to help develop local tech talent. When Intel first tried to hire local staff for the $1 billion testing and assembly plant it built in 2010, it had difficulty finding qualified engineers. To build its talent pipeline, the company created a special study-abroad program to train engineers for its facility, spending $7 million to send 73 students to Portland State University in Oregon. If Vietnam can continue to develop its tech talent at home, a new generation of skilled workers will allow the country to export progressively higher-value products. If that doesn't happen, however, the country will probably attract new investments only until cheaper locations emerge somewhere.* (Greene, 2014) & (Vietrade, 2015)

One encouraging indicator of workforce performance was posted by the Vietnam General Statistics Office, showing that labor productivity increased by 6.4% between 2014 and 2016.

Clearly, Cambodia, Thailand, and Vietnam need to develop a more skilled workforce to progress higher in the global VC (GVC). This task is the responsibility of the countries' own educational systems. However, it is also incumbent upon foreign investors, who benefit from their highly profitable operations in these countries, to build local skills in the short term while helping to strengthen the capacity for sustained workforce development (WFD) in the longer term.

2.1.2 Secondary research summary findings: Tourism

Southeast Asian tourism sector overview

The World Tourism Organization lists Southeast Asia as having the world's highest growth in international arrivals in recent years. They attribute this to the region's price competitiveness and the rapid expansion of its middle class (i.e., residents have greater expendable income, allowing them to travel more often to neighboring countries). However, the World Tourism Organization acknowledges that investments are still needed in digital connectivity, infrastructure, and the protection of rich but depleting natural capital (Business-in-Asia, 2016a). Without these investments, continued rapid growth in arrivals will erode the touristic experience. This is especially true now because the increased regional cooperation resulting from the ASEAN agreement will further boost tourism as visa policies and cross-border business regulations become harmonized.

In terms of competitiveness rankings, all three countries have crept up slightly during the past six years, although none of them has significantly improved their standings (***Table 1***). Vietnam and Cambodia are held back by infrastructure, accommodation, and customer service issues, whereas Thailand has experienced temporary setbacks arising from instability and safety concerns, which peaked during the 2014–15 political unrest.

Table 1.   Travel & Tourism Competitiveness Index (TTCI): 141 Countries Ranked According to Overall Competitiveness

Country	2009	2015
Cambodia	108	105
Thailand	39	35
Vietnam	89	75

TTCI 2015

Briefly, tourism in the region is continuing to grow mainly because these countries are inexpensive destinations and remain somewhat novel to many travelers. While these factors are effective in the short term, they do not constitute a secure base upon which sustainable industry growth can continue. Thus, the industry will need to transform itself to offer a superior overall traveler experience, which is only possible by elevating the professionalism among industry members and their employees.

Cambodian tourism sector overview

International tourist arrivals to Cambodia increased from 290,000 in 1998 to nearly 5 million in 2015 (Trading Economics, 2016). Such rapid growth has been paralleled by a rise in recognition (internally) of tourism as a strategic economic sector, especially during the past decade. Since 2005, tourism has become a leading source of employment and economic development and is currently responsible for over 10% of GDP.

The growing tourism sector has contributed in multiple ways to the development of the local economy. It has raised the national income, improved the country's balance of payments, and encouraged investment in related sectors, e.g., hotels, restaurants, tour services, sporting facilities, and transport. Tourism has also provided strong support for secondary and tertiary sectors, such as arts & crafts, agricultural production, food processing, and even business financial services. Indeed, all of these sectors have benefited greatly since Cambodian tourism gained a foothold.

Tourism revenues are generated primarily around the Siem Reap–Phnom Penh–Sihanoukville triangle. The presence of a world-renowned site—the Angkor Wat temple complex—helps to differentiate Cambodia from other nearby competitors. However, although its other attractions, such as coastal resorts and casinos, are popular, they compete directly with similar offerings elsewhere in the region.

Cambodia may benefit tremendously from the ASEAN Agreement as it strives to become a core component of the broader Mekong destination. However, to do so, it will need to offer a tourism experience on par with those of others, such as Thailand. *"While Cambodia may present a lower-cost option, this is often at the expense of the quality of tourism services being offered, such as sanitation, infrastructure, transport and customer service"* (Noyelle, 2014). Of course, it is the latter, i.e., customer service (and, more broadly, industry professionalism), that is so dependent on an improved WFD system.

Thai tourism sector overview

Despite a brief downturn during several months of 2014 and 2015 related to political instability and street protests, Thailand has bounced back as strongly as ever in international tourist arrivals. It is projected to remain in the 10th position for international tourism receipts, although it will likely drop to 11th in international tourist arrivals by the end of 2016. Thus, Thailand is second only to China in the Asia Pacific region and is closely followed by Malaysia. As an exotic Southeastern Asian destination, Thailand faces growing competition now that other markets, such as Vietnam, Cambodia, Laos, and Myanmar, are expanding their tourism offerings. However, the regional activity offers a tremendous opportunity for Thailand to transform itself into the region's anchor destination and take the lead in offering integrated packages.

Thailand is already aggressively courting China, the largest tourism source market in the world, by expanding direct air service between Chinese cities and Thailand, mostly via Air Asia. Airport expansions are in the works to facilitate these efforts. Thailand has also established new multiple-entry, 6-month visas, which greatly facilitate regional travel to and from nearby countries.

New plans for cross-border tourism with Cambodia and Myanmar, in addition to cruises that link with the Philippines, are all underway. Expansions in mid-scale hotel assets, as well as some of the luxury variety, are also planned, though demand continues to outstrip supply. "*A trend to smaller hotel assets with fewer readily available investment grade properties is further keeping the hotel market tight*" (4Hoteliers, 2016).

All of these efforts demonstrate why, from a policy perspective, Thailand is well ahead of Cambodia and Vietnam in recognizing and embracing tourism as a key strategic industry. Naturally, the country has a considerable head start over the other two, and intends to retain its lead.

Nonetheless, the Thai tourism industry is not without its problems. While the World Economic Forum ranked Thailand 10th overall, it scored last in the region behind even Myanmar and the Philippines for *safety and security* because of political turmoil, ultimately reducing its overall ranking (Business-in-Asia, 2016b). Potentially even more damaging for Thailand's reputation in the long term is the spate of tourism scams, as reported by the Ministry of Tourism (MOT). Bogus hotel booking sites, tour operators, and tour guides take credit card payments in advance from tourists and then cancel the bookings once the payments are received. There have been hundreds of complaints by tourists duped by such schemes. The MOT recently signed an agreement with the Professional Tourist Guides Association, the Association of Travel Agents, the Thai-Chinese Tourism Alliance Association, and the Tourist Police Division to tighten and enforce regulations for traditional tour operators and tour guides (Ngamsangchaikit, 2015).

Despite Thailand's role as a regional tourism leader and a long-standing, preeminent player in the sector, the domestic tourism industry's view of workforce skills, as expressed by respondents to this survey, is little better than that in Cambodia or Vietnam.

Vietnamese tourism sector overview
Vietnamese tourism has also grown steadily, with tourist arrivals projected to exceed 8 million in 2016, more than twice as many as in 2005. Growth is continuing and is anticipated to reach 8% next year. According to a report by the World Travel and Tourism Council, the 2014 total tourism contribution to Vietnam's GDP was 367,238 billion dong or 9.3% of GDP (Chanwanpen, 2015). This value puts Vietnam's tourism sector on par with that of Cambodia's in terms of overall importance to GDP.

The Vietnamese tourism offering is, similar to those of its neighbors, diverse, with strong ecological, cultural, and beach assets. Years of wars and strife destroyed vast areas of ecosystems; however, what remains or has been recovered is extensive and varied. These assets include high mountains; 2000 miles of coastline; unspoiled national parks, including the large Cuc Phuong Park; over 2000 islands and islets; diversified geography; and rare wildlife.

Despite private-sector complaints about the government too often getting in the way, there is a fairly strong degree of vision for the industry at ministerial levels. One example of this is the country's efforts to engage with several other Mekong countries to create a single destination in terms of joint promotion and management. A recent focal area has been the creation of a World

Heritage Route connecting the listed sites in each country, which would make it easier for tourists to link them during their travels. The ASEAN agreement will certainly facilitate this idea. Vietnam has also reached out to Thailand specifically because of that country's regional leadership (Chanwanpen, 2015).

Despite Vietnam's growth and development, being a relative newcomer to hosting large numbers of tourism arrivals, its touristic environment continues to fall short of international standards. In terms of competitiveness, the tourism environment (security, health care, and sanitation) scores 4.6 of 7 points, and policy scores 3.7 of 7, whereas natural and cultural resources score only 2.9 of 7. Infrastructure is evaluated at the lowest level among the four factors (Business-in-Asia, 2016a). Thus, while tourism assets abound, their presentation and the professionalism of industry members are often sorely lacking.

Without making significant improvements in these areas, Vietnam, similar to the others, will not be able to sustain current growth levels or offer a quality tourism experience.

2.2 Regional electronics and tourism differences and similarities: Entry-level jobs, gender dynamics, regional integration, and growth potential

2.2.1 Regional VC and GVC dynamics and implications for WFD systems

Tourism

The single most-significant development in tourism with respect to regional integration in ASEAN is the Mutual Recognition Arrangement on Tourism Professionals (MRA-TP) agreement, which will increase the mobility of labor within the ASEAN region by establishing a single set of knowledge, skills, and abilities (KSAs) requirements related to each of 32 specific jobs. This should be an economic boon for the region as a whole, permitting better matching of skills with jobs than is currently possible. Similarly, tourism-related businesses should benefit from a wider pool of talent. This improvement should be especially helpful to businesses operating in environments with sub-standard training systems, which could benefit from access to workers trained elsewhere. However, laborers in each country will not all benefit equally: workers with access to more sophisticated training systems will likely be able to achieve the skills standards more quickly than those with less-sophisticated ones. Furthermore, workers with language skills will be more mobile than those without them. Thus, some workers who have greater English facility, such as those from Singapore, Laos, and the Philippines, will naturally be more mobile than those from other countries, and more-skilled workers, such as those from Singapore and Malaysia, will benefit from greater opportunities at the expense of less-skilled ones.

Workers in Cambodia, Thailand, and Vietnam are likely to be short-term losers because of these countries' sub-standard training systems and relatively low English facilities. This impact is likely to be twofold: More foreign workers are expected to migrate to the Mekong, whereas tourism workers from these countries will face challenges in taking their skills elsewhere. Thus, the best jobs at the five-star chains (which, as we discuss later, are the primary employers of graduates from the EIs with which we spoke) will become increasingly competitive.

One aspect of regional tourism that will surely change relates to the newfound ability for cooperation in cross-border tours. The effect of this ability will be to further incentivize and draw countries together more naturally in pursuit of a common means of destination management. Whether these countries cooperate to develop regional cultural heritage trails or adventure tours, by working together, they should help the entire region sell as a single destination and increase arrivals overall.

The MRA-TP carries significant implications for the educational systems in our three target countries. Perhaps most importantly, English language training (and, perhaps, training in a third language) will be needed to prepare graduates for what is sure to be increased competition and to compete for jobs elsewhere in the region. However, with this challenge comes opportunity: schools will have access to an increased supply of foreigners with tourism experience in other, more sophisticated countries. These foreigners could be targeted by universities as guest lecturers, bringing with them best practices from their home countries.

Electronics

It is probably most helpful to consider the electronics-related educational system through the lens of the GVC for electronics products to gain some insight into its effectiveness in preparing labor in these countries not just for today's skill needs but also for those that will likely evolve over the next 10 to 15 years.

One characteristic of the demand for skills that distinguishes electronics from tourism is that, whereas university and TVET graduates are effectively competing for the same jobs in tourism, in electronics, a stronger divide exists: higher-skilled jobs tend to go to university graduates, whereas lower-skilled jobs are allocated to TVET graduates. The specifics of that divide differ from country to country. For example, in Thailand, university graduates typically gravitate toward the limited design work being done in the country or toward high-end assembly. In contrast, TVET graduates generally take lower-end assembly and technician jobs. In Cambodia, where little to no design work is being done, most university graduates become technicians, and TVET graduates are principally assembly workers.

However, the electronics GVC is dynamic, and its activities are highly mobile. Thus, the set of activities in which a country currently participates can (and frequently does) change over time. As Thailand prices itself out of basic assembly (a process that is currently underway), it will need to increase its capacity to compete for higher-value design work or it will have to exit this VC altogether. Increasing costs in Thailand also represent opportunities for countries, such as Vietnam, which because of its enormous vocational sector, can produce large numbers of assembly workers and, therefore, perform the same work at much lower cost. Similarly, some of this work could shift to Cambodia because of its abundant young, cheap workers. However, a country's ability to position itself within the GVC is highly dependent on its educational sector. If Thailand is not producing university graduates specializing in design, design work will not be conducted there. Similarly, Cambodia may benefit from young, cheap labor, but if that labor is not converted into trained human resources (HRs), this country will be poorly positioned to absorb assembly work as it moves away from Thailand.

Currently, Thailand is facing a Catch-22. For years, students have shied away from studying design because of the limited number of design jobs. However, because of the limited number of students studying design, the country lacks the critical mass of design engineers to attract design work in the electronics VC. Perversely, this phenomenon has driven many of the top design candidates into financial engineering, according to one interviewee. Thus, Thailand's role in the GVC is both a determinant and a function of the skills developed by the university/TVET sector, which also determines the opportunities that graduates will have available to them. To encourage more interest in the design field, institutions could co-sponsor (with the private sector) prize-based competitions, such as design challenges and World Skill Competitions. These would introduce students to practical private-sector challenges, give them a chance to apply their knowledge, and introduce an element of "fun" to the curriculum while also allowing them to achieve professional recognition. The moment may be ripe to encourage the study of design in universities because students may be more inclined to do so in light of their newfound ability to take those skills to other countries offering more sophisticated work if they cannot find suitable opportunities in Thailand. In the long run, they may return, start businesses in their home countries, and thereby drive more sophisticated industries in those countries.

2.3   General state of WFD system response

While skills development is currently on the minds of many countries worldwide, this issue has taken on a different dynamic in countries in the ASEAN region because of the advent of the AEC, which is designed to promote the mobility of labor across the region in eight occupations, including tourism industry professionals and engineers. Although this agreement will spark economic growth throughout the region, it presents special challenges (and opportunities) for aspiring professionals in each relevant field in Cambodia, Thailand, and Vietnam. Indeed, this agreement opens up new avenues of opportunity by allowing graduates access to a wider range of job options. However, the ability of graduates to realize these opportunities will depend on their having the necessary skill base. Conversely, those graduates who lack the hard or soft skills to take advantage of their increased mobility will face greater competition from graduates from elsewhere in the region.

2.3.1   Tourism

Tourism programs in Cambodia, Thailand, and Vietnam are relatively new, with even the oldest programs generally having started in approximately 2006. Prince of Songkla University (Phuket), which was founded in 1994, represents a notable exception. Although a few programs are actually quite strong, their overall quality is uneven, and they are insufficient to satisfy the exploding demand.

Thailand's tourism schools are predominately university level and include public schools, such as Mahidol, Thammasart, Chulalongkorn, Silpakorn, and Kasetsart; private institutions, such as Assumption Business Administration College, Rangisit, Bangkok University, and Stamford; and public institutions, such as Suan Dusit Rajabhat and Suan Sunanta Rajabhat, which were formerly vocational schools but have since become universities. Its TVET system, however, is

quite weak, and anecdotally, most of the universities we spoke with were unable to further increase their capacity, which is reflected in the production of skilled workers in the tourism industry. In 2012, according to Thailand's National Statistics Office, the total number of skilled hotel workers was just over 270,000, well shy of the 1 million skilled hotel workers required by the country, according to a 2014 estimate by the Government Public Relations Department (Government Public Relations Department, 2014).

Vietnam offers a much more robust TVET sector (albeit of uneven quality), but its universities, similar to those in Thailand, do not provide much in the way of practical application. In fact, a recent survey of 183 accommodation providers in Vietnam showed levels of satisfaction with TVET graduates that were 20 percentage points higher (15 percentage points higher regarding communications skills) than those of university graduates. Perhaps surprisingly, university graduates did not score any better than TVET graduates on skills such as English language, teamwork, leadership, or management (ERST, 2014). Universities in both Thailand and Vietnam see their hands bound somewhat by the need to maintain their status as "leading universities," which is inconsistent with a skills-driven curriculum. Furthermore, according to one observer, professors in Vietnam are more interested in conducting research than in developing the more practical aspects of their programs.

In contrast, Cambodia lacks any indigenous vocational education sector at all, and its vocational schools are either run by foreign nongovernmental organizations (NGOs) or funded by foreign donors. Some of the larger NGOs include Sala Bai, Paul Dubrule, Don Bosco, Friends International, Pour un Soirie d'Enfant, Hager Catering, NYEMO, and Krousar Thmey. Meanwhile, the National Polytechnic Institute of Cambodia is a government-run (but donor-funded) school with fully equipped kitchens and training facilities. Although some of these vocational schools are actually fairly robust, whether they are sustainable or able to scale up to meet the growing demand of the tourism sector, which is expected to increase from its current 4.5 million visitors to 8 million by 2020, is uncertain.

One informant in Cambodia estimated that demand will reach 1 million skilled workers by that time, far exceeding the current estimated supply of just 65,000. This shortfall is reflected by the number of enrollments: the TVET system only produces approximately 500 tourism graduates annually, and only 1.7% of the total enrollments in higher education are in tourism (Kuoch, 2015). As a result, the private sector has struggled to fill its available jobs. A 2013 National Employment Agency (NEA) study conducted in Siem Reap showed that over three quarters of tourism establishments indicated that they were unable to fill their skill needs, including 86% of restaurants and 85% of enterprises in the accommodation sector (Khieng, et al. 2015).

These numbers are discouraging, but whether the graduates who are produced are prepared to contribute in their new roles is even more concerning. This uncertainty is largely a result of the EIs' insufficient orientation toward the needs of the private sector, which is attributable to several factors. Private-sector interactions can be broadly described as limited in all three countries. Additionally, placement offices are either weak or, often, non-existent, and faculty lack work experience (particularly at universities; this is less of an issue at the TVETs), and private-sector involvement in curriculum is informal if it exists at all.

Although informants indicated that internships are generally required in Thailand and Vietnam, little assistance is provided in finding them. EIs believed that Cambodia lacks an "internship culture," which may be a shared responsibility of the EIs and the private sector, as neither engages substantially with the other. Instead, internships in universities are often replaced by less-helpful class projects or theses, which are unlikely to expose students to a real-world work environment in any meaningful way. (The private sector did not entirely share this sentiment, contending that internships did, in fact, happen, particularly in hotels, despite being poorly coordinated.) Whereas Thailand, in particular, has a culture of using guest lecturers from the private sector, this occurs less frequently in Vietnam and almost never in Cambodia. Soft skills development is generally weak, and language skills are an especial source of concern. The limited use of educational technology in university classrooms; and of applied technologies in TVETs, is also worth noting.

These issues are explored in further depth in the following pages. Encouragingly, at least two clear best-practice examples exist among the tourism schools that could be leveraged by USAID. One of these, Dusit Thani, is discussed in detail as a case study in Section 3.5. These schools do not fit the profile described above and instead are run according to something akin to international best practices.

2.3.2 Electronics

Because electronics is a dynamic, fast-moving industry, it requires a WFD system that is equally so. While an educational system that supports competitive industries is an imperative from the economic development perspective, it is also central to the graduates' abilities to obtain quality jobs. The educational system should not only prepare graduates for current jobs; indeed, it also has a responsibility to position future graduates for the jobs that are likely to be available in the next decade. Furthermore, the educational system is an important determinant of *which* jobs are available to future graduates because work in the electronics VC tends to gravitate toward countries with well-developed skill bases.

However, neither Thailand, Vietnam, nor Cambodia has an educational system that can be described as "dynamic." Presently, Thailand appears to have the greatest need for agility and responsiveness to support higher value-added activity in the electronics VC. According to the Thailand Board of Investment (BOI), more than 60 public and private engineering schools across the country are certified by the Council of Engineers. Additionally, this country features a network of research centers and institutes offering technical training, including the National Science and Technology Development Agency (NSTDA), the National Electronics and Computer Technology Center's (NECTEC's) Industry/University Cooperative Research and Development Units, King Mongkut's University of Technology, the Asia Institute of Technology, and Khon Kaen University. However, interviews with several of these players revealed that most of the cooperation currently taking place centers on research and development (R&D) (such as in Integrated Circuits, or ICs, as detailed later in this report) rather than workforce upgrading. Furthermore, most of the work is in lower-value assembly activities rather than design. Some isolated initiatives are being undertaken to address the system's shortcomings.

According to the Kennan Institute, the Rajamangala University of Technology Lanna has introduced a work-integrated learning platform to encourage the development of industry-specific skills through internships, and the Chevron Enjoy Science project is a five-year public-private partnership with the NSTDA that is rolling out 6 STEM and TVET hubs nationwide to build workforce skills in several sectors, including microelectronics.

Currently, Vietnam is probably the best-positioned of these countries to support the type of work consistent with its role in the electronics VC because of its reasonably robust vocational sector and current industry needs for strong graduates in assembly. However, Vietnam suffers from inconsistent quality at the TVET level. A 2012 Japan International Cooperation Agency (JICA)-supported survey (Hanoi University of Industry-JICA, 2012) of private sector employers of graduates of the Hanoi University of Industry's education and training programs is illustrative: most respondents gave only modest scores for students' technical knowledge of specific areas of electronics. The graduates' ability to operate computer-aided design and computer-aided manufacturing (CAD/CAM) machines was an area singled out for improvement. One of the key challenges in Vietnam is the lack of data, with TVETs suffering from insufficient information about the skill needs of private enterprise (JICA, 2014). In addition, the educational and training system in Vietnam will ultimately confront the same challenge as that of Thailand: to effectively compensate for the inevitably rising costs and subsequent need to move up the VC, the educational system must increase its agility and responsiveness to private-sector needs.

Cambodia's challenge will be the conversion of large numbers of young people into a significant quantity of workers with sufficient skills to handle assembly work. A 2012 JICA study cited in a recent report found that if Cambodia aims to attract 6–8% of GDP in foreign investment by 2020, it would need to produce an additional 35,000 engineers and 46,000 technicians (Madhur, 2014). This shortfall relates to the throughput of the educational system. Indeed, a recent study by the NEA showed that the proportion of graduates in engineering was only 3.8%, and that of all technical certificates and associate's degrees awarded, just 6.0% were in engineering and manufacturing (NEA, 2015). The issue is not only one of quantity: a separate paper published by a leading research company, the Cambodia Resource Development Institute (CRDI), indicated that some private-sector actors believe that a Cambodian engineering graduate has, on average, the skills equivalent to that of a first-year college student from another country in the region (CRDI, 2014).

Our findings add nuance to the existing research. In Thailand, the university curriculum is strongly theoretical rather than practical, which can be partly attributable to the following factors: the origins of the curriculum, which is developed by a body, the Council of Engineers, that is largely academic in nature and cannot be altered; the lack of practical experience among faculty; and insufficient feedback mechanisms, such as in the curriculum development process, to orient the curriculum in a more practical direction that is aligned with private-sector needs. The placement system is also lacking, and placement offices are either non-existent or poor performing. Notably, we did find that graduates made relatively frequent use of career fairs. However, many students find both jobs and internships through their own networks or through faculty connections.

Job placement seems to be a lower priority for schools because related activities, such as job fairs or interfacing with businesses to place graduates, were of little interest. Accordingly, none of the schools with which we spoke tracked their graduates to determine whether they were employed, where they worked, or what their salary was. A clear gender imbalance also exists, most of which appears to be pre-determined by the time young women reach higher education. Finally, the TVET system is underdeveloped, and many of the schools that had been TVETs became universities (such as the Rajapat schools), effectively gutting the TVET system.

In contrast to Thailand, Vietnam features a large TVET sector; for example, according to one interviewee's estimate, 100 TVETs exist in Hanoi alone. However, in addition to the previously mentioned variable quality of these institutions, the technologies they use for hands-on learning are often inadequate, with state-funded institutions being far better equipped than private ones. Similar to Thailand, the higher education curriculum tends to have a stronger theoretical orientation (even in the fairly robust TVET sector); although the roots of the problem are different.

No longer bound by a common curriculum requirement, universities in Vietnam are largely able to develop their own curricula (except for some basic subjects in, for example, government). However, interaction with the private sector is fairly limited, and the curriculum does not always reflect industry needs. There appears to be a regional dimension to this pattern, with greater engagement occurring in the south than in the north. The placement issues in Vietnam are similar to those in Thailand. Importantly (perhaps in Thailand as well), although all university students are required to do an internship, the value of the internships is limited, and interns often perform basic tasks that do little to prepare them for actual jobs. Placement in Vietnam is heavily skewed toward either public companies or, as we found in our secondary research, toward MNCs, such as Samsung and Intel. Collaboration with the private sector is more common in areas such as R&D than it is in developing short courses with industry. The technology used in the classrooms is basic, partly because of the lack of resources and the lack of familiarity with the technologies among professors themselves. As in Thailand, graduate placements are not generally tracked.

Finally, in Cambodia, links between the private sector and the EIs are significantly weaker than those in the other two countries. Placement offices, as in Thailand and Vietnam, are rare, and the "communications offices" that most often perform this function frequently provide no services other than job postings. Cooperation in areas such as curriculum development and internships is nearly non-existent, and schools tend to draw on foreign universities and donors to fill the bulk of their curriculum development requirements and substitute class projects or theses for internships. Schools expressed frustration with private-sector enterprises for their unwillingness to contribute to the curricula or provide meaningful internships.

Very little use is made of private-sector representatives as lecturers in class, and although some professors ostensibly have some private-sector experience, this is most often limited to having owned a sole proprietorship, which provides little perspective on the employment needs of larger enterprises. There appears to be an ample supply of university graduates for assembly jobs. Thus, the main task is to increase their quality, as most schools indicated that significant re-training or up-skilling is necessary once graduates are employed. Most graduates from TVETs tend toward

working in maintenance or repair jobs, with some working in assembly jobs. University graduates more commonly find roles as technicians in higher-level assembly jobs, often in areas such as testing and quality control. Poor connectivity, sometimes on campus but particularly off-campus (especially in rural areas), hamper distance-learning efforts, and classroom technologies are rudimentary.

One complicating factor for both sectors in all three countries is the structure of the educational system. Universities are housed under the Ministry of Education, whereas TVETs fall under the purview of the Ministry of Labor, and the two ministries only infrequently coordinate their efforts. Although this dichotomy broadly affects the entire WFD system and is, therefore, outside of the scope of this particular report, it is important to remember that there are dimensions of the educational system in each country that are fundamentally public policy and administration issues and require resolution at that level.

2.4   Employer perspectives on tourism WFD

At the onset of this section, and that of the findings related to electronics (2.7), we start with re-statement of key 2016 COMET LMA findings (COMET, 2016). This report's findings add context and detail to the LMA:

- Nearly 70% of firms in the region, and across sectors, report planned hiring.
- 56% of employers in the region find staff through personal networks, receiving an average of 15 applicants per position.
- Employers are looking for interpersonal (40%), communication (43%), teamwork (46%), adaptability (46%) skills.
- 60% of employers think their employees need additional soft skills training upon hiring.
- 90% of employers claimed their managerial positions require technical skills, also citing cross-cutting skills in computer and English as important.
- Bachelor degrees are increasingly important; with 73% of employers requiring one for technical jobs and 94% for managerial jobs.
- A majority (72%) of surveyed employers indicated that they do not have gender preference for their positions. Yet, fewer females overall are hired as full-time/part-time staff, or as technical or managerial staff in comparison to their male counterparts.
- The composition of the tourism workforce is 45% female and electronics workforce 58% female, though this varies greatly by country, with Vietnam leading in gender equity.

2.4.1 Finding, training, and retaining employees: Tourism

The following findings are derived from our nearly 70 surveys and interviews of private-sector actors and EIs. Unless otherwise noted, the findings are attributable to these data. While the limitations related to the number and type of respondents should be considered, we have attempted to triangulate these data with our secondary review, knowledge of the COMET program, and other publically available data and resources.

The first section of the survey administered to companies (both tourism and electronics) addressed how employers recruit and train employees. The purpose of these questions was to get a sense of the recruitment process, EIs' involvement, and the extent to which training was required to make employees fully functional. These questions served to both illuminate these topics specifically and to validate subsequent, more-detailed questions on EI collaboration.

Activities to find new employees

The vast majority of tourism providers rely on their own websites and internal job posting boards when recruiting new employees. This behavior corresponds to a stated preference for promotion from within, whenever possible. Both large and small companies also frequently turn to third-party job bulletin boards, such as jobs.com, to expand their reach. The use of one's personal network to gain access to job candidates also remains popular, though most interviewees were loath to admit it. Recruiters are not a popular option as they are perceived to be expensive and generally ineffective, i.e., unable to understand the most critical attributes employers seek in candidates. Recruiters are therefore relegated to finding applicants for vacant managerial positions but typically only when other methods have proven unsuccessful.

Perhaps the most significant finding was the industry's complete lack of confidence in university and vocational institution career placement centers. Most interviewees felt that career centers have yet to fully evolve, and as a result, the industry virtually ignores those that do exist. The few that had attempted liaising with career centers typically received few or no job applicants and came away with the perception that students were themselves not even routinely checking career center postings. In Vietnam, there is an historical context as well. Until a decade ago, the placement of job seekers was the responsibility of a municipal authority. Currently, in all three countries, the career-placement role has largely been taken on by individual academic departments (within EIs) via direct contacts with industry by professors or their supporting administrative units. Thus, the fundamental problem is the ad hoc nature of contacts between industry and EIs[1] and their utter lack of systemization.

Training and retaining employees

Because companies remain largely self-reliant in the recruiting process, they also conduct the bulk of employee training through their own means. Whether for hard or soft skills, small and large enterprises usually train their own staff. As would be expected, large, international hotels clearly reside at the upper end of the scale in terms of training sophistication. Indeed, they have the technical resources in place to orient and upgrade employees at all levels and phases, from beginner housekeepers to experienced general managers. Moreover, most large hotel properties incorporate internationally accepted HR practices with quarterly plans and reviews, access to regular online training modules, and an expectation they be routinely used by staff. These training systems also benefit smaller domestic firms, hotels in particular, which take on personnel trained by larger hotels and gradually adopt these methods themselves.

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[1] EIs include all vocational and post-secondary higher learning institutions.

Generally speaking, the differences in training practices between countries are minimal; the main variation is in the sizes of the entities providing the training. As such, smaller domestic enterprises, such as hotels, travel agents, and tour operators, arrange much of their own staff training, albeit at a lower level of sophistication and with less costly resources (most rely on domestically or regionally hired trainers). Additionally, rather than achieving an average of five to seven days of training per employee per year, as the large enterprises do, they might instead average two to four days.

At the smallest end of the scale—hotels and tour operators with tens of employees rather than hundreds—training tends to be informal and conducted on the job by other, more senior staff. Nonetheless, the smaller tourism entities believe they are adequately addressing their needs to orient new employees and upgrade existing ones.

The range of training undertaken by the private sector is extensive and includes the following:

- Hard skills: management, accounting, sales, revenue analysis, labor law, ticketing, housekeeping, maintenance, departmental specifics (usually on the job), food and beverage (F&B), food safety, guest safety, and first aid; and

- Soft skills: corporate compliance, property orientation, customer care, leadership, Word/Excel, English, motivation, money management, personal success factors, and grooming.

Missing from the above picture are perceived knowledge and skills inputs from academic institutions. In fact, these are valued to some extent, mainly in terms of accessing graduates possessing at least foundational knowledge or, in the case of vocational institutions, certain core skills sets. **However, the reality (and perception) exists that extensive, in-house employee training by tourism enterprises remains necessary because degreed and certificated job applicants still lack the applied skills and knowledge necessary to be functional immediately after completing school.** Hope remains, however, that the MRA-TP (standardization of job qualifications) across ASEAN nations may improve this situation.

> **"Educators are overly academic in their approach and more worried about pushing large numbers of graduates out the door than giving students the skills they need to work. We would be happy to support educational programs, even with volunteers to teach at universities or allow more work study at our hotel."**
>
> *Hotel General Manager, Bangkok*

Employee turnover rates and their underlying reasons typically yield insights into labor market failures. For example, these data may reveal systemic problems among employers and/or illuminate social and educational causality. In the three countries surveyed, tourism industry turnover varied greatly and did not exhibit a clear correlation to any particular country or type of entity, with one exception: hotels in Bangkok appear much more affected by increasing turnover rates than the other tourism enterprises interviewed. The main reason is the explosion in new hotel property development. Every time a new, large hotel is constructed in the city, hotel employee turnover soars. The turnover rates are then slow to retract as competition continually

increases. This phenomenon is changing the very fabric of the tourism labor market, at least in Bangkok, and labor itself has been the main beneficiary. To attract the most qualified staff, including those with the strongest soft skills and best attitude, hotels are finding it necessary to out-bid their rivals. As a result, employee compensation packages are improving, with higher salaries and better benefits increasingly on offer. **One Bangkok hotel explained that only a few years ago, their employee compensation was 18% of the total operating costs, whereas now, it is 30%.**

Aside from the higher-than-usual turnover experienced by Bangkok hotels, which can be explained by the number of new properties being built, the industry does not see itself as experiencing a significant turnover problem. Most interviewees believe that although they would always prefer lower turnover, they were not particularly concerned by the existing levels. Nonetheless, nearly half of those willing to overtly address the turnover issue reported experiencing double-digit rates. Additionally, it may be supposed that most of those who did not identify a percentage are experiencing similar turnover rates.

The reasons given for tourism industry turnover, at least from the perspective of the private sector, rarely identified causes of their own doing. This was true even amongst those who admitted turnover rates in excess of 20% (approximately one-fifth of the respondents). Employer perceptions regarding the underlying causes of turnover were generally grouped into two main categories: (1) cultural factors and (2) inadequate educational preparation. However, as some employers have significantly lower turnover than comparable competitors, some portion must be attributable to internal organizational issues.

Perceptions about cultural factors and their contributions to higher turnover rates were overwhelmingly centered on what was most frequently referred to as an attitude problem on the part of new hires. The feeling was that recent university graduates (more so than people emerging from vocational schools) seeking first-time employment are filled with unrealistic expectations about working conditions, remuneration rates, and their own worth relative to their experience. These factors and the fact that they are prone to jump to any new employer offering a marginally higher salary generate unending frustration on the part of industry managers. The reasons underlying this type of behavior by new hires are thought to emanate from early family influences and the inability of the educational system to imbue practical soft skills and rational employment expectations as students approach graduation. Employers are handling these *attitude issues* by attempting to train and reorient new hires toward practical ways of balancing career aspirations with personal life interests.

Implications for finding, training, and retaining employees: Tourism

- EI career centers are seriously underutilized by both student job seekers and employers. Career centers must either be systematically strengthened to the point where students and employers see value in their use, or have their resources diverted in favor of departmental administrative units. The latter, along with direct contacts with professors, are presently much more heavily relied upon by employers seeking job candidates and offer the potential for more relevant, rapid coordination with EIs. Because this trend seems

organically based, it may be more sensible to systematically strengthen the departmental administrative units in lieu of artificially propping up dysfunctional institute-wide career centers.

- Although university and TVET graduates are valued for their foundational knowledge and the sense of purpose they have demonstrated by completing a degree/certificate program, overall, their practical skills are sorely lacking. Unsurprisingly, more avenues are needed to systematize industry input and participation in updating curricula . One spillover effect will be reduced turnover as recent graduates gain greater confidence in their skill levels and, therefore, experience less impatience and frustration as first-time employees.

- Employee turnover is not acknowledged as a significant industry problem, but the turnover rates are not particularly low either. The new-hire attitude problem, e.g., unrealistic expectations that clearly exacerbate turnover, is not easily actionable at family cultural levels. However, structured inputs at the primary, secondary, and post-secondary educational levels could be impactful. Required curricula, including practical life/social/career planning skills, need to be imparted at an early stage and reinforced throughout the educational experience, particularly during the final two years of post-secondary studies.

2.4.2 Hiring needs and preferences for gender, skills, and education: Tourism

Hiring needs and preferences

Despite the previous studies' findings and, indeed, the COMET LMA, very few interviewees indicated that significant numbers of new employees are urgently needed or even required in the near future (within two years). This is one advantage of face-to-face interviews over other means: it is possible to ask questions in a manner that discourages overly optimistic or, conversely, pessimistic responses. Thus, the need for realism may be reinforced and clarifications sought, as necessary. The lack of a sense that large numbers of employees are urgently needed was validated by responses to another question indicating that most respondents projected fairly stable staff levels one year out. The largest number of urgently needed new hires indicated was noted by a large hotel, which reported needing 15–20 F&B staff. Additionally, a large tour operator indicated future hiring expectations (within two years) of approximately 40 employees, the largest number offered and one that reinforces growth trends in Southeast Asian tour services. However, although these responses may be somewhat of an anomaly, there is the very real possibility that large numbers of new hires will, in fact, be needed because of an influx of new properties and investments; this type of need cannot generally be discovered via interviews with existing entities.

Where intentions to hire at least some new employees were indicated, the indicated positions typically fell into five categories: front desk, housekeeping, F&B, tour guides, and managers. The first three jobs tend toward higher turnover rates, which is a self-reinforcing phenomenon because new hires have the greatest propensity to also leave prematurely. This tendency of new hires to leave the tourism field shortly after entering was also noted by EIs, which attributed it to

a lack of prior field exposure among many students enrolling in tourism courses. In many cases, fresh graduates are simply not prepared for the often harsh realities of dealing with the public. The fourth category, tour guides, involves a somewhat time-consuming trained skill. Finally, managers were listed because a difficult-to-find combination of multidisciplinary knowledge and supervisory skills are necessary to be effective. The need to recruit competent managers was an issue that emerged among hotels, tour operators, and restaurateurs. In fact, importing managers, more often than not from sister operations/properties around the region, is common. The need for qualified managers is most evident in Thailand, where industry maturity and growth require greater sophistication.

In terms of education and experience preferences, when hiring for line positions, the responses varied but were fairly evenly divided. About half the employers sought some high school or vocational education whereas the other half did not value applicants' educational levels and would accept experience in lieu of education. Most did acknowledge that the specific skills imparted by vocational schools were indeed useful and sometimes include some language proficiency, which is of fundamental importance among hospitality employers. **However, irrespective of education and experience levels, two of the most important hiring criteria for line staff were unequivocal: attitude and perceived trainability.**

Regarding front office (administrators, supervisors, and middle managers) and higher-level positions, the responses were again similar across all three countries. A university degree is generally preferred, as is one to three years of experience, though neither is strictly required. The requirements become somewhat more rigid for anyone approaching the level of middle management or above. However, once these filters have been met, the hiring decision is again strongly dependent on attitude, which is felt to be a less-trainable characteristic but is critical for absorbing company culture. Somewhat surprisingly, many of those making hiring decisions are equally as happy for front office employees to have economics degrees in lieu of a tourism or hospitality degree. The underlying rationale for this acceptance is that staff with economics or business degrees have a more well-rounded and practical outlook than those coming out of hospitality programs.

Questions about gender revealed how difficult it can be to uncover the underlying reality concerning preferences for male or female employees, even during face-to-face interviews. Most respondents initially asserted that their companies had no preference for women or men and would hire the most qualified candidates, regardless of gender. These responses fairly closely follow the COMET LMA conclusions, wherein nearly three-quarters of the respondents indicated no gender bias against women. However, in the survey herein, when pressed for more detail, respondents would occasionally contradict themselves and indeed express a preference for a specific gender in certain roles or situations, and the preference was often for females.

One company stated they prefer women in *all circumstances*, which would lead one to expect more female employees, but that company's numbers indicated a 50/50 split. Approximately one-sixth of respondents said they preferred women in customer-contact roles, including sales and front desk positions, because they believed that females are "more pleasant to deal with." One cited a preference for women in housekeeping roles, indicating that they are "more detail

oriented." However, although 30% of interviewees noted that at least some positions are more suitable for women, among those who provided employment figures, females still represent only approximately 46% of total employment. Furthermore, only 27% of managerial positions are held by women, at least among those willing to address this question.

Certainly, a disconnect between respondents' assertions about gender hiring practices versus the number of women actually employed remains, particularly in higher-level, better-paying positions.

> "We prefer females for front desk and custodial jobs, but have no real preference for other types of work. Family and child care can be a problem for women. Plus, they don't feel comfortable taking the late shift, so we tend to use males for overnight work."
>
> *Hotel HR Manager, Siem Reap*

When asked about impediments to hiring women, most respondents were reticent to suggest that any existed at all. However, when pressed, some revealed that there were certain situations in which females are believed to be disadvantaged. Two respondents noted after-hours work during the peak season as being problematic for female employees, mainly because of family worries about traveling after dark. This issue led to a general reliance on men for after-hours or overnight work. A few other interviewees indicated a preference for men in positions requiring physical strength, namely, runners, who carry equipment between floors for housekeepers, and bellboys, who must handle luggage. While the strength issue undoubtedly has some basis in practicality and, perhaps, some logic before the advent of elevators and rolling suitcases, such norms are less viable now. Another person preferred men in tour guide positions from the standpoint of safety, particularly in remote areas. In the end, approximately one-quarter of respondents cited some positions/situations as mainly for men.

Skills in short supply

Three position-related skills sets were most commonly indicated as difficult to find: middle managers, sales or marketing professionals, and upper-level managers. Each of these has one aspect in common: They all require a multidisciplinary set of knowledge and skills. Middle and upper level managers must have supervisory skills to motivate staff, industry proficiency in their specific function, and the skills to understand financial reports, and higher-level managers must also have the ability perform revenue analytics. Marketing and sales professionals similarly need multidisciplinary skills, including a strong foundation in tourism marketing strategy, excellent language skills, and the credibility (and personal characteristics) to effectively sell services. **It was generally agreed in all three countries that universities do not adequately prepare graduates with such diverse skills sets.**

However, a question related to soft skills generated the most energized and detailed discussions among interviewees, and the results demonstrated remarkable similarity across Cambodia, Thailand, and Vietnam:

- English language and communication topped the list of skills most tourism entities desired among job seekers and new employees. English language in itself is available, but many made the distinction between commonly spoken English versus professional-level skills. Equally important, particularly among tour operators and hotels, is the need for

written English at a professional level. This is because of both sectors' widespread use of email confirmations, which must be clear and concise. Some respondents went so far as to say that they would routinely seek students from language faculties over those from hospitality programs, further emphasizing the need for English at a high level. Mandarin and Russian (the latter more so in Thailand) were also noted as increasingly important.

- While not precisely a skill, the terms *attitude* and *trainability* were the most-commonly referred to weaknesses when discussing soft skills among recent university graduates in both tourism and electronics. The attitude issue invoked a number of sub-categorical behaviors and attributes generally lumped together as problems with mindset, most of which were related to unrealistic expectations and general trainability. The vast majority of respondents expressed frustration with young graduates (less so for vocational graduates) and their inability to realistically assess an offered position relative to their own inexperience. Young job seekers were often described as making unrealistic salary demands and, if hired, demonstrating impatience to advance well before their experience dictated. An inability to absorb training (i.e., helping new employees adopt the company culture and an appropriate manner of working) was frequently cited as paramount among the list of attitude issues.

- The next most-frequently cited soft skill weakness was the inability to take initiative, which was mainly expressed in terms of employees requiring too much explicit direction. This was followed by lack of teamwork and, for middle managers, lack of leadership or supervisory skills.

The above three bullet points mirror a portion of the COMET LMA findings, which indicated the following: *"Over 60% of respondents noted that half of their employees needed to have upgraded soft skills such as communication, teamwork and adaptability"* and *"For nontechnical skills, English language skills …remain in demand and key to hiring decisions."*

Reasons for skills shortages

The responses to a question concerning the underlying reasons for skills gaps and attitude problems fell into two main categories: (1) cultural and family upbringing and (2) overly generic education with a focus on rote learning from primary school through university.

Employers perceive cultural and family upbringing as being too nurturing, spoiling children while simultaneously pushing them to make quick money rather than have a long-term, career-building perspective. No one is precisely certain why this is more pervasive today than, perhaps, a generation ago, but some theories do exist. One is that family sizes are smaller, and children are growing up with more attention than previous generations. Another, more likely scenario involves the advent of consumerism and the growing middle class. Materialism is rapidly gaining traction and driving people to *require* higher salaries. These factors and the frequent need to support extended families are purportedly eroding the work ethic in favor of an overzealous pursuit of short-term salary gains, particularly among young people. The result is less emphasis on active, in-depth learning and a tendency toward unrealistic, often quick materialistic expectations.

If family and culture were largely blamed for the shortfall in soft skills, educators were usually perceived as the primary cause of inadequate tourism competence and knowledge (the so-called hard skills). However, educators were also frequently cited as at least partly responsible for the soft skills issues found among recently graduated job seekers. Universities are routinely described as turning out people with generic knowledge and few practical or applied skills. Industry seems to have accepted this fact and expects nothing else, which is one reason why internal training programs have evolved to such a sophisticated degree.

The private sector asserts that EIs are slow moving, reluctant to change, and often stuck in an academic framework that may have been relevant decades earlier. Although they generally did not denigrate the manner in which EIs operate, **many respondents did complain of a vicious circle phenomenon wherein universities/TVETs remain highly averse to adopting new curricula. Regardless of how much *pressure* industry applies to educators to develop updated curricula reflecting the skills they seek in graduates, EIs often claim that their hands are tied and that too few paying students could be expected to enroll in the new programs.** Respondents consistently complained of low private sector involvement in the curricula development process – both with universities and TVETs. The situation was probably best described by the Director of the HCMC-based Vietnam Chamber of Commerce and Industry (VCCI). The VCCI Director asserted the degree to which an EI (in Vietnam) was open to private sector input for new curricula development was typically more reliant on the sophistication of its management than its classification as a university or TVET. Despite this, the belief exists that TVETs are inherently more flexible (than universities), and as such, easier to work with in jointly developing new curricula. This particularly the case in tourism where TVETs are relied upon more heavily than universities for new hires. Nonetheless, the lack of consistently strong coordination between EIs and the private sector in development of new curricula virtually ensures that the academic environment will continue to trail well behind industry needs.

> **"We do some part-time lecturing at a local university but it is not enough to make a real difference, because such a large part of the curriculum remains weak."**
>
> *Hotel Manager, HCMC*

Finally, and this was specific solely to tourism, several comments were made about the inability of EIs to imbue any hint of a cross-cultural education. As one respondent put it, *"...many employees lack empathy in guest communication; the ability to sincerely and confidently speak with people from different countries requires exposure to different cultures."* This is a succinct way of saying that students need practical exposure to various cultures during their education, well before they meet their first foreign national on the job.

Implications for hiring needs and preferences for gender, skills, and education: Tourism

- Despite the relative ambivalence among tourism employers regarding the need for tourism/hospitality degrees or vocational certificates for line staff, there is a clear preference for university degrees for front office and managerial employees, mainly to ensure at least some rudimentary tourism knowledge (and to demonstrate that the employee has the discipline to complete a task). With this in mind, universities should

focus on the skill sets most often described by industry as difficult to find, which would help increase EIs' value to industry. These skill sets include the multidisciplinary skills needed by middle and upper-level managers: (1) supervisory/motivation/management, (2) industry strategic analysis, and (3) basic financial and revenue analysis. The multidisciplinary skills needed by tourism sales and marketing professionals should also be focal points for EIs: (1) industry marketing strategy, (2) professional-level language skills in English/Mandarin/Russian, and (3) sales skills. These must be treated by EIs not simply as individual course requirements but intensive skill-engendering programs through multiple course levels (beginning to advanced). Thus, imparting various skill sets customized according to the nature of the student's core focus, e.g., management and operations, marketing and sales, or customer service, is key.

- Although and, in fact, because gender diversity is not recognized as a problem, a societal comfort level exists that prevents a more aggressive approach to decreasing this disparity. A public education program could shed light on this issue, particularly among sectors, such as tourism, that mistakenly believe they have achieved gender parity. Publicity campaigns targeted at employers and designed to educate them about actual hiring statistics would generate awareness and set the process in motion.

- Clearly, the soft skills and attitudes of recent graduates are generally seen as greater obstacles to satisfactory job performance than even the lack of hard industry skills, especially among line staff. EIs absolutely need to take this issue seriously and introduce more soft skill curricula required for degree completion. Such curricula must have input from industry volunteers who are best suited to offer their own (modified) programs and training of trainers (TOT) for professors and/or initially teach the classes themselves. Many industry managers indicated a willingness to assist with short-term teaching at any universities interested in adopting new courses in their core curricula. Courses with modules on work readiness, career planning, realistic expectations, and the importance of taking initiative would address the types of soft skills industry and EIs should be cooperating to achieve. These concepts should actually be introduced in primary and secondary school and then intensified at the university level, especially during the final two years.

- Various universities and TVETs have competency in languages. The main critical need is to emphasize the importance of higher-level spoken and written language skills, which can be verified through testing, including verbal exams. The development of language and other noted soft skills, such as cooperating with others (related to teamwork), learning to be creative (related to taking initiative), and even leadership, must begin as early as primary school.

- Universities and TVETs must be persuaded to involve more private sector stakeholders when considering new curricula for adoption. Otherwise, the so-called vicious circle wherein new curricula, which are unknown to students and, therefore, not yet demanded, will never be adopted, and the dysfunctional cycle will remain unbroken. One way to

persuade large academic institutions to change their ways in this respect involves providing resources for new curricula, industry part-time lecturers, and in some cases, upgraded physical facilities to improve the attractiveness and practicality of the learning environment for students. A concerted effort to include at least one protracted cross-cultural experience for tourism students should be made involving targeted internships.

2.4.3 Overcoming skills gaps and the role of educators

Methods to train people and overcome skills gaps
On-the-job training is easily the most commonly used means to train new employees to both orient them to the work environment and provide the department-specific skills and knowledge needed to perform their jobs. Short courses offered in-house are the most common method of upgrading the skills of existing employees and are used by large and small entities alike. Large hotels and tour operators have standardized curricula, most of which is available online via cloud-based systems. Smaller companies tend to implement TOT for one or two longstanding staff who, in turn, train others. Large hotels, of course, tend to have full-time trainers and engage in classroom-style training, including interactive skills. Off-site courses are also used, albeit to a lesser extent. Larger companies often send people to sister properties in other countries, whereas smaller tourism enterprises use offsite (but usually in-country) contracted trainers for both soft skills and certain hard skills, e.g., accounting or taxation.

Realistically, much of this training will be conducted whether EIs are turning out well qualified graduates or not, especially that related to company culture and various property specifics. However, **training in the broader sense would certainly be less intensive, less frequent, and less costly for industry (i.e., lower recruitment costs) if graduates arrived with more practical skills.** Incidentally, one tourism federation suggested that it is becoming more common for companies to assist their employees who wish to pursue degree programs. However, this was not corroborated during the individual company interviews. Only one concrete example was offered: one Vietnamese company offers people bound for management what is termed a mini-master of business administration (MBA) degree in cooperation with a foreign university.

Industry linkages with EIs
As noted previously, when discussing the presence or lack of systematic linkages with EIs, a theme became immediately clear: EI career centers, in the classical sense, do not function at a level where most industry members even consider using their services to recruit potential employees. Instead, when members of the private sector initiate contacts with EIs, they almost always do so through personnel in specific academic departments of interest.

> **"We've tried working with universities in the past, but it is difficult to get them to change the way they do things. The best people are very busy with their regular teaching responsibilities, and the universities don't push or incentivize other types of activities with industry. So trying to influence them at this point is not very promising."**
>
> **Hotel General Manager, Bangkok**

Most regular interactions with EIs occur through internships and more intensive workforce-based learning arrangements. Internships tend to involve three-month terms (occasionally longer) and typically include third year and later students. They are often arranged during the low season to give staff more time to work with the interns in a lower pressure environment. In contrast, more intensive workforce-based learning programs typically take fourth year students and recent graduates for work during the high season to help the hotel (usually) cope with peak demand while offering the students a realistic opportunity to assess the work environment. These practices appear fairly consistent across all three countries. Unsurprisingly, foreign universities (especially in Vietnam) tend to be more proactive in seeking out internship opportunities in industry. One tour operator in Vietnam said that they had been contacted by several foreign universities for cooperation, including Britain and Germany, but had not been contacted by local universities. Again, though, at least in terms of home-grown tourism EIs, TVETs are more frequently cited than universities as having forged some links with the private sector, particularly for workplace based learning activities.

Job fairs are also quite well attended by larger tourism companies, especially hotels, who usually participate in one or two per year. In Cambodia, a longstanding annual career fair has been organized by the government, and in Vietnam, municipalities organize such fairs as well. These efforts may have eclipsed some emerging efforts on the part of academia, but the events are reportedly well attended and at least foster a culture of bringing employers and job seekers together in the same space. Moreover, it was commonly stated that many universities also organize such events and that industry members attend.

Nonetheless, as noted earlier, industry is generally not optimistic about routine, systematic cooperation with EIs, particularly in sourcing well-qualified graduates for employment.

Particularly strong comments among the respondents in Vietnam noted that the government impedes improving the educational experience. The failing educational system is apparently discussed occasionally, but little is ever done to improve the situation. This context has led to a fatalistic attitude, and in effect, it has generally prevented industry from engaging in any concerted form of cooperation with EIs. In frustration, one tour operator opened its own, informal training center because the licensing procedure is bureaucratic and difficult. The only other option is to take graduates from the state-sponsored tour guide training and licensing authority, which is done out of necessity; however, in this case, re-training is immediately initiated.

> **"In Vietnam, politics influence everything and until this changes nothing will improve the way universities operate."**
>
> *Tour Operator Manager, HCMC*

Some private, higher educational schools are also beginning to appear in Vietnam, but their fee structures indicate a lack of any social pretense whatsoever, as only the wealthy can afford them.

The private sector has not stepped up to offer substantial industry-wide training through associations, chambers, or federations. Nonetheless, some training is taking place, for instance by the Cambodian Federation of Employers and the Cambodian Restaurants Association. However, considerable prodding of interviewees was needed to discover that any private sector-led training was happening at all, particularly in Vietnam and Thailand. Business development services (BDSs), including private-sector associations, are not well developed and utilized.

Implications for overcoming skills gaps and the role of educators: Tourism

- To further incentivize private sector collaboration with EIs, a useful exercise would involve initiating a survey of private-sector training costs and determining the portion that might be eliminated if recent graduates' skills in specific areas were improved. Such an exercise would allow regional tourism providers to conduct cost/benefit analyses for corporate budget decision makers and free up funds to support curriculum development in collaboration with partner academic institutions.

- A program to strengthen existing tourism associations may be worthwhile in cases involving an operating history and a respected management group. Efforts would focus on building their capacity to offer demand-driven, revenue-generating short training programs while implementing an institutional development model that works to strengthen linkages between industry and EIs.

The following case study illustrates the interest and resolve of a large, well-resourced regional tourism provider to be directly involved in the formal, certificated training of tour guides. They are also collaborating with a (foreign) university to better educate tourism managers through a mini-MBA program. The case study underscores two inadequacies in Vietnam's educational and vocational system and offers a practical means of altering the status quo. The tour operator remains anonymous because of the nature of comments made about the government-run entity, which has a near monopoly on tour guide training.

Large Asian Tour Operator Seeks to Improve Educational Landscape in Vietnam and Beyond

A leading tour operator working in 11 Asian countries and offering products encompassing eco-, adventure, cultural, and beach tours, wants to be a driver of educational change.

We spoke with staff at the regional headquarters of the tour operator in Ho Chi Minh City (HCMC). The company employs 200 full-time employees and another 100 part-time workers in Vietnam alone. Eighty percent of their full-time employees are women (including 4 of their 15 managers). The company is experiencing rapid growth and expects to expand its workforce by over 20% in the coming year. It is owned by a hospitality group that also owns hotels, ensuring that it has access to resources.

The tour operator explained that one of its greatest challenges involves recruiting suitable tour guides. In Vietnam, all guides must be licensed. A government-run authority, Saigon Tours, is responsible for the licensing process and also trains most of the guides in the country. However, upon graduation, Saigon Tours' guides do not possess a high standard of skills or knowledge. It is assumed that every guide coming out of the Saigon Tours training program must be re-trained immediately upon hiring, but ,at least, is already licensed. No other reliable tour guide training centers exist in Vietnam, although a number of vocational schools produce decent food and beverage graduates, among other specializations, for the hospitality industry.

"There is a serious lack of labor supply, especially in central Vietnam. Skills like English, time management, social interaction with others and simply finding people with the right attitude – these things are just not easy to find here. The education system is generally poor, passive, and lacking in creativity. People learn lots of mathematics but few life skills or soft skills. Discussion about upgrading the educational system frequently occurs but very little actually ever happens. In fact, we have universities from the UK and Germany regularly reaching out to us for internships, but we never hear from our own universities. "

The problem of finding qualified employees does not end with tour guides. This company has simply resigned itself to the fact that managerial-level job seekers are generally not available in Vietnam. Indeed, no EI programs graduating skilled, knowledgeable management candidates exist, and Vietnam does not have the history of tourism that Thailand and others do. As a result, experienced people are difficult to come by. For these reasons, when internal promotion is not feasible, the company turns to hiring from outside the borders. The Association of Southeast Asian Nations agreement has made this easier, and although the impact on company management will be positive, many Vietnamese who would otherwise have an opportunity to grow into managers may be passed over.

This tour operator understands the importance of a supportive and positive workplace, which is one reason that its turnover is relatively low and generally does not exceed 10%. Additionally, its policy of promotion from within, coupled with the possibility of training or working at one of its overseas entities, is enticing for employees. The training is multifaceted and includes new employee induction, formalized tour guide training, soft skills education, and, for management-bound staff, a so-called mini-MBA.

The mini-MBA is a novel concept in the industry, and nothing similar was identified during meetings anywhere else in the three Lower Mekong countries surveyed. Managerial candidates and, in some cases, existing managers are selected from multiple company locations to attend courses on weekends in a single place. For example, Hanoi was a recent locale (they have partnered with a French university in Hanoi, which also has a campus in HCMC). This arrangement produces a six-month, compressed mini-MBA at an international standard, and the results are *"…superior to anything they would be able to undertake at local universities."*

While clearly doing their best to circumvent the inadequate educational system in Vietnam, this tour operator remains unsatisfied with the status quo and is motivated to help with focused, systematic improvements at EIs. The company would be delighted to be introduced to COMET personnel for discussions about the possibility of collaborating to bring university/TVET curricula in line with industry needs while incorporating EI partnerships. Its work with the French university has shown the company that such partnerships can be very effective and serve multiple objectives. Moreover, the company firmly believes that its expertise could be implanted at select universities and vocational centers for collaborative program development to benefit the industry as a whole.

2.5   EI perspectives on tourism WFD

2.5.1   *Perspectives of tourism EIs on industry needs, curriculum orientation, and skill-building*

In general, institutions have done little to assess the needs of tourism enterprises, often attaching low priority to this activity because of their feeling that the excess demand would ensure that all of their graduates would eventually obtain jobs. While this may be true, it still limits the students' effectiveness on the job and will make graduates vulnerable to the anticipated influx of labor from elsewhere in the ASEAN region.

> **"There is so much demand in the tourism sector that 90% of our graduates are hired shortly after graduation."**
>
> *-Tourism University Representative, Cambodia, shrugs when asked whether he is concerned about the skills they teach being unaligned with private sector needs*

One university in Cambodia (clearly the exception to the rule), however, had conducted a formal labor market study. **Their finding, which our research suggests applies broadly to all three countries we visited, revealed the following disconnects between workforce supply and demand in the tourism sector: (1) communication skills, including communication with superiors/subordinates and with customers; (2) technical skills; (3) soft skills, including decision making, leadership, teamwork, languages, and communication with superiors/subordinates; and (4) facility with information technology (IT) and languages.**

When asked to rank their perception of the importance of specific jobs, EIs most frequently indicated that they believed customer service jobs (including front desk and housekeeping jobs) were most valued by private-sector employers. This was followed closely by marketing/sales and culinary/F&B, which was especially highly valued in Cambodia. Management jobs generally ranked a fairly distant fourth, only ahead of the very specialized area of tour guiding. This finding underlines an interesting parallel with the views of the private sector. Tourism industry respondents routinely indicated a local shortage of qualified managers, but they do not look for managerial candidates from universities, preferring to either import them from elsewhere in the region or promote longstanding employees. In either case, a nominal private-sector preference for degreed candidates still exists, though the type of degree appears less important than merely having one.

Interestingly, however, most universities (including those that ranked management relatively low) insisted that they viewed their purpose as training managers, not front-line employees. According to their perspective, jobs requiring very specific skills were the purview of vocational and technical schools, not universities. In Vietnam, for example, this modality is codified because schools in this country are divided into three categories: (1) research only, (2) producers of applied research taught in the classroom, and (3) schools that more closely resemble vocational-technical schools, focusing purely on practical skills. A university's prestige can be reduced by orienting the curriculum in a more practical direction. This perception was reflected in the orientation of the curricula across all three countries, as universities tended toward either

the theoretical or coupling the theoretical with the practical, whereas vocational schools broadly attempted to equip their graduates with more practical skills.

Both universities and TVETs were nearly unanimous in identifying the major international hotel chains as the principal employers of their graduates, including 5-star hotels, such as Hilton (Shangri-La), Four Seasons, Ambassador, Dusit, Hyatt, Marriott, Inter-Continental, and Le Meridien in Thailand and Vietnam; and 4- and 5-star establishments, such as Le Royal, Frangipani, Sofitel, Sunway, and Nagaworld in Cambodia. In some cases, graduates also joined major tour operators, with EXO Travel (formerly Exotissimo) being mentioned repeatedly. **However, although universities perceived a certain complementarity of skills (with universities providing management talent and TVETs providing front-line employees), TVETs generally considered their graduates to be in direct competition with university graduates for the same jobs.** Universities further contended that graduates of TVETs lacked the upward mobility of university graduates given their lack of a university degree. In contrast, most TVETs argued that their graduates were perceived at least as well (and sometimes more favorably) than university graduates because of their practical orientation, willingness to do the "dirty work," and more modest salary demands.

As alluded to in section 2.4 above, it is fair to say that TVETs have more accurately assessed the preferences of private-sector employers. Indeed, most employers are reticent to hire recent graduates directly into management roles without their having obtained the requisite experience in front-line jobs. **Thus, it is likely true that TVET graduates are, in fact, in direct competition with university graduates for the same jobs and that upward mobility is more a function of performance in those jobs than prior educational attainment.** In addition, a few universities acknowledged what the private sector perceives as unreasonable salary demands on the part of university graduates. The one area in which universities can be argued to have an advantage is in soft skills development, which is strongly desired by employers; however, this appears to be less a function of the years of study attained by the student than of the specific curriculum of a given school. Some TVETs have incorporated soft skills training into their curriculum in response to the concerns expressed by private-sector partners.

Furthermore, regarding soft skills development, **the most prominent issue raised in our interviews with the EIs were English language skills, with several institutions expressing significant concern about their graduates' abilities to compete with the anticipated influx of workers from the wider region**. Singapore, Laos, and the Philippines are of particular concern because their workers have an inherent advantage in language skills, as do those from Malaysia. A few schools have actively addressed the issue through either introducing English language coursework into the curriculum or teaching some or all of their courses in English. However, they remain the exception rather than the rule. A very limited number of forward-thinking institutions have also begun to introduce a requirement for a third language, with Chinese or Russian being popular choices. An additional concern expressed by one TVET was that TVET courses, which can range from 10 months to 3 years but are consistently shorter than university degrees, are generally not long enough to build robust foreign language skills. In response, some

have a stated policy that entering students must have English language skills or have introduced intensive English courses that students must complete (and pass) prior to being admitted.

It is likely that both TVETs and, to a greater extent, universities have overlooked the importance of developing other soft skills and the roles, as discussed in section 2.4, that attitude and trainability play. In other cases, there is simply a lack of knowledge about how best to deliver soft skills education. One key element that could be readily integrated into classroom learning is the use of targeted technologies. **We found that only a limited number of schools introduce technologies into the learning process. However, greater training on the use of relevant software (such as Amadeus, an airline booking system) would better prepare students for the on-the-job challenges they can expect to face.**

> **"I have been asked by businesses to incorporate more soft skills training, but I don't know how I am supposed to be building soft skills in the classroom."**
>
> *-Tourism University Representative, Thailand*

Additionally, **while our research focused heavily on tourism programs, it is clear that numerous workers ultimately employed in the tourism sector did not study for a tourism degree**, which is readily acknowledged by representatives of tourism schools. Business administration graduates (especially those studying relevant fields, such as accounting, finance, and marketing) are particularly frequently employed in this sector. One professor in Thailand with whom we spoke even indicated that she believes employers prefer these graduates over those emerging from tourism programs, given the discernible skills that they offer. This preference was corroborated by several respondents on the private-sector side.

Conversely, not everyone who studies for a tourism degree will work in the tourism sector or be employed there in the long term. Another university professor drew a helpful distinction between students entering his programs with prior industry work experience (perhaps in a family business) and those with none. He stated that the former group was sure of what they wanted, whereas upon taking their first job in the sector, the latter group often found that it failed to meet their expectations. As a result, many of the graduates in the latter group dropped out of the sector within five years. This was most often a function of the requirements of customer-facing jobs, in which dealing with rude, unfriendly, and difficult people is a matter of course. One institution with which we spoke indicated that they have tried to address this issue up front through the use of basic psychometric tools in making admissions decisions.

2.5.2 *State of private sector-EI collaboration*

We have identified seven "touch points": potential intersections between private-sector enterprises and EIs that collectively play an important role in transmitting employable skills to students. These include the following:

- *Private-sector involvement in curriculum development*. Private-sector representation in the curriculum-development process is critical to ensure that the curriculum is responsive to private-sector needs. This benefits companies by ensuring that the educational system

serves as an effective feeder but also benefits students by ensuring that they are graduating with relevant, employable skills.

- *Placement offices*. Good placement centers not only open doors to employment opportunities through job postings and linkages to employers but also provide the soft skills training that students require, such as interviewing skills and curriculum vitae (CV) development. Indeed, they can serve as the most direct links between students and employment opportunities.

- *Internships*. Internships are the most (and in some cases the only) practical element of curricula. Internships increase the probability that students will be immediate contributors in future jobs and provide important information about whether they have chosen the right career field. They also give companies the chance to evaluate people who may become their future employees.

- *Faculty links to companies*. Using faculty to train industry professionals strengthens university-industry linkages, provides useful continuing education opportunities for industry, and allows professors to gain an applied perspective on the subjects that they teach, which is desperately needed given the limited number of faculty in each country with private sector experience.

- *Use of private-sector lecturers in the classroom*. Bringing industry professionals into the classroom to lecture, the flip side of encouraging faculty to deliver training to businesses, is a valuable way for students to gain a practical perspective.

- *Company-sponsored class projects*. Company-sponsored projects can partially compensate for the lack of private-sector involvement in the curriculum. Such projects benefit students by giving them hands-on experience while helping the company to solve problems it may lack the resources to dedicate its full attention to.

- *Extent to which faculty have private-sector experience*. Faculty with a private-sector background bring different (more applied) perspectives to the classroom.

Below, we apply this framework to tourism education in the region.

Placement offices: **Most institutions lack placement offices. As a result, most placement support (which is generally limited) occurs through departments and/or faculty members who happen to have relationships with private-sector actors.** In these cases, businesses approach the specific faculty member and inquire about their best student(s). In Cambodia, placement generally falls under the auspices of a "communications" office, which is normally staffed by a single individual. The services these offices offer are generally limited to job postings. Support for specific skills, such as CV development and interviewing techniques, is uncommon. Although these skills are occasionally covered in a required course, one university representative in Cambodia acknowledged that he is relatively displeased with the skills students develop in this area.

Private-sector involvement in curriculum development: **The private sector plays only a limited role in the curriculum-development process**. In Thailand, the role of the private sector in curriculum development can be characterized as modest and informal. In only a few cases did the private sector sit on a formal curriculum advisory committee, and in one of those cases, the university representative acknowledged that this was simply because it was a requirement for Association to Advance Collegiate Schools of Business accreditation. Typically, input is obtained from the private sector in a non-systematic, irregular, and informal manner; some examples included surveys, questionnaires, faculty discussions with the private sector, feedback obtained at exhibitions, and feedback from alumni. Additionally, it is worth noting that the curriculum is only revised approximately every five years at the university level, as per Thailand's requirements. (Vocational schools tend to update their curricula with greater frequency, often every year or two). These five-yearly curriculum revisions would seem to be too infrequent to keep pace with private-sector needs. (In a few exceptional cases, schools voluntarily revised their curriculum more frequently in a proactive attempt to keep their students' skills relevant). In some cases, the curriculum is determined in part by reviewing the curricula offered by other schools. In Vietnam, the private sector played no formal role; rather, its voice is represented by the faculty members with whom they may have interacted. Vietnamese institutions tend to rely fairly heavily on foreign partners, such as those from France, the UK, and, particularly, Australia, for curriculum inputs. Recent state-mandated changes have reduced the number of requirements with respect to courses, allowing more innovation in course development. In contrast to Thailand and Vietnam, in which the private sector appeared to play at least a limited, informal role, in Cambodia, the private sector is frequently excluded from the process altogether. A few institutions relied on foreign curricula, especially among vocational schools, which tend to be either foreign NGOs or funded by donors.

> **Applying Good Practices: Introducing Job-related Skills**
>
> Internships are a critical part of any curriculum. While many of the schools we visited require at least one internship, one school in Thailand requires 400 hours (or 40 weeks) of practical training. This requirement can be met by participating in one internship per year or two per year during the student's final two years. Furthermore, the internships must be in different areas of the tourism industry: an F&B internship comes first, followed by front office and other hotel positions. Alternatively, the same skills can be developed in an applied fashion within the context of the classroom. One university in Thailand had set up its own hotel school that complements its full-time staff with student interns who complete 3-week rotational assignments in areas such as the front desk, restaurant, and housekeeping, giving them a taste of real-world work experience prior to completing an external internship in the following semester. In Cambodia, one TVET had its own on-site hotel rooms mimicking those in the major chains. Another university in Thailand, in addition to a sample hotel room, also had mock-ups of a restaurant and even an airplane.

Internships: While internships are generally required at institutions in Thailand and Vietnam (as indicated by 86% of respondents), **students must usually find their own and are provided little to no assistance in doing so**. Thus, students generally have to draw on their own personal networks (or those of their professors) to locate internship opportunities. **Cambodia, on the other hand, features very few institutions that offer what might be recognized in the West as an internship**. Instead, students are required to complete either a class project or a thesis, which generally requires some period of observing a business (or certain roles within the business). However, this would seem a poor replacement for an actual internship. It is unclear why a culture of internships has not developed in Cambodia. EIs attribute it in part to the unwillingness of private enterprises to accept interns. According to EIs, these enterprises cite the limited value that interns bring to the businesses. Interestingly, private-sector interviewees consistently indicated the common usage of interns, even in Cambodia, although not always with a particularly high level of cooperation with universities and TVETs. In this sense, demand continues and could certainly be strengthened with more emphasis and coordination.

Links between faculty and private enterprises: Apart from informal conversations between faculty and companies, the primary mechanism by which faculty connect with enterprises is through the provision of training, either on campus or on business premises. **In Thailand and Vietnam, some training of businesses by faculty is currently occurring, and these trainings/services may include research, business/corporate strategy, and new product development. Those institutions that are not yet engaged in providing training (either on or off-site) did express a strong interest in doing so. In Cambodia, however, essentially no tradition of faculty providing either training or consulting services exists.** In fact, there is little to no use of consulting services by the tourism sector in Cambodia at all. One university faculty member suggested that this is partly because tourism, as a relatively new field, is populated by younger professors, who are not held in high esteem in a society that shows greater respect for older, more experienced professionals. He also suggested that very few enterprises use consulting

> **"Businesses here don't plan; they just do."**
>
> *-Cambodia Tourism University Representative, explaining why consulting services aren't used there*

services of any kind, which he attributes in part to the fact that most enterprises are small, family-owned outfits. He believes that this dynamic will change over time as these enterprises grow. Some tourism respondents indicated the use of job fairs as a routine means to recruit people, and these events appear to be increasing in popularity. These fairs are organized in cooperation with universities and TVETs, although some remain largely the domain of local administrations, especially in Vietnam and Cambodia.

Use of private-sector lecturers in class: **Guest lecturers were used periodically in Thailand and Vietnam (generally a few times per semester) but almost never in Cambodia**. In the former cases, guest lecturers were most frequently used in courses that could be described as "practicums" or courses designed to include a practical element. In the latter case, however, private-sector presence on campus generally seemed to tend toward marketing opportunities rather than toward opportunities to impart practical knowledge.

Projects co-sponsored by companies: Project-related work in courses has gained traction in all three countries. However, **while such projects are viewed in Thailand and Vietnam as complementary to internships and the practical, hands-on experience they provide, in Cambodia, they were often perceived as a substitute for (or equivalent to) the internship experience.** In Thailand and Vietnam, projects were usually sponsored by companies with a problem that needed to be resolved. In contrast, in Cambodia, they were frequently designed such that students would spend a fixed amount of time (100 hours, for example) observing either a company, company unit, or employee in the company and would then write a thesis based on their observations.

Prevalence of faculty with private-sector experience: Overall, **it was more common to find faculty at the TVET level with prior work experience than at the university level**. This trend was particularly true in Thailand and Vietnam, although a few of the universities we engaged with in Thailand had made significant efforts to deliberately incorporate more private-sector involvement. This dynamic differed somewhat in Cambodia, where most faculty had work experience. However, their experience tended to be gained by running their own (generally small and/or family-owned) company while teaching on the side.

Modeling Private-Sector Orientation: Dusit Thani School of Tourism

The Dusit Thani School of Tourism in Bangkok, Thailand, is a model for the successful orientation of a program to the needs of industry and the resulting enhancement of its students' employability.

Dusit Thani, a university spinoff of the Dusit Hotel Group, is just four years old. It offers both undergraduate and graduate degrees in tourism, with approximately 3,700 students studying at the undergraduate level and another 70 pursuing a master's degree. Although the school is small relative to some of its more-established counterparts, it has been growing rapidly. Indeed, the school estimates that intake has been increasing at approximately 20% per year, and a second campus in Pattaya is already needed to accept roughly 1,000 "spillover" students. The hotel group and the school are not affiliated. Although some of its graduates join Dusit upon graduation, the vast majority end up with other high-end hotel chains, such as Shangri-La, the Four Seasons, and Marriott.

What sets Dusit Thani apart, however, is the way it has incorporated a private-sector lens into everything it does. The school is one of only a few with a fully functioning placement office, which not only posts available jobs but also prepares students to be successful in applying for them by teaching employability skills, such as resume development and interviewing techniques. The school incorporates private-sector input into its curriculum development process, and rather than reviewing and changing its curriculum every 5 years, as per Thailand's requirements, it does so voluntarily every 2–3 years to ensure that the content of its program is consistent with private-sector needs.

Every student completes between 1,200 and 2,000 hours of supervised field training as a requirement of the program, and the school engages actively with the country's Tourism Alliance and with hotels and operators to place its students. Furthermore, rather than pursuing the traditional university model of hiring professors who have only an academic background, all faculty come to the program with work experience and are then taught how to teach by the school. Although Dusit Thani cites teaching faculty to be effective instructors as its greatest challenge, it also embraces this activity as the best way to ensure that its teaching incorporates a strong practical element. To further supplement its students' experience, most of the practically oriented courses have a robust complement of visiting lecturers from industry, who may teach a course anywhere between two and four times per semester.

In a yet another demonstration of its commitment to engaging with the private sector, Dusit Thani has an agreement with Hong Kong Polytechnique, the top school in the region, to offer professionals continuing professional education in areas such as revenue management; meetings, incentives, conferences, and exhibitions tourism; and food and beverage and is exploring a similar arrangement with the Lausanne Hotel School.

Importantly, the school has also developed a robust focus on soft skills, which was emphasized repeatedly by private-sector actors in our survey. In particular, the school stresses the use of technology and offers an international program taught in English. Additionally, it intends to introduce training in Chinese (Mandarin) and Japanese in the future.

As a result of these innovations, Dusit Thani's graduates are among the most-demanded of all tourism schools in Thailand.

Although Dusit Thani's perspective is certainly informed by its roots in a private hotel chain, many of the mechanisms it uses to actively engage the private sector and to impart employable skills to its graduates are highly replicable. The Dusit Thani case also shows the value of identifying some newer, less-established schools as models. Sometimes, schools unshackled by tradition are the most aggressive innovators and can serve as trendsetters for the rest of the education sector.

2.6 Employer industry trends and expected tourism workforce needs

2.6.1 Industry product and demand trends impacting future skills requirements and hiring practices

Three industry trends emerged that will significantly impact the types of skills future tourism employees will require. First, the entire tourism distribution system is rapidly changing. Hotel, flight, and tour bookings are increasingly made online by travelers directly, and thus, the industry must develop sophisticated systems to keep pace, and employees must understand how to use them.

Another trend is the increased need for Mandarin and Russian language skills, with both source markets now contributing substantially to international tourism arrivals. Indeed, China is now the largest source market.

Finally, the rapid growth in tourism arrivals throughout the Lower Mekong region is generating its own set of challenges, particularly in large city markets, such as Bangkok, where new properties are being built monthly. This growth is creating a situation in which staff turnover is necessitating that existing employees be promoted more quickly than their experience levels may otherwise dictate.

Implications for industry product and demand trends impacting future skills requirements and hiring practices: Tourism

- Tourism programs and curricula will certainly need to be more technology focused in terms of both hardware and software. Already, tour operators are complaining that graduates cannot handle a basic ticketing system or even understand the need to back-up their own files on a computer. If left uncorrected by EIs, the inadequacy of existing curricula will be compounded as technological developments continue to accelerate. Graduates need to be well acquainted with third-party booking systems, e-commerce, e-marketing platforms, and the role of mobile devices throughout the distribution scheme.

- Hospitality and tourism programs will need to incorporate a broader spectrum of languages at a high level, especially English, Mandarin, and Russian and, to a lesser extent, French (particularly in Vietnam), Spanish, and Italian. This proficiency will need to be professional level for spoken and written language.

- Strong industry growth and the frequent premature promotion of staff constitute an important opportunity for EIs to add short-term (6- to 12-week) intensive continuing professional education (CPE) programs for industry. This is a niche that is seriously underutilized by EIs and is also a potentially excellent revenue earner. However, elevated skill levels among lecturers and up-to-date curricula are pre-conditions for CPE programs to be taken seriously. Thus, stronger partnership programs between industry and EIs, such as those referenced and undertaken in the Vietnam tour operator example, are required.

2.6.2 Tourism industry: Articulated needs for skills and knowledge

Table 2 summarizes the responses to questions designed to **identify the types of skills and knowledge that industry interviewees are most concerned with now and in the foreseeable future** when seeking new employees. The first two columns represent the skills and knowledge they most frequently seek and/or have difficulty finding in new recruits. The last column is intended to reflect a natural extension of the first two columns and guide EIs regarding possible courses to offer through CPE programs.

Table 2. Tourism Skills and Knowledge

Hard Skills/Knowledge	Soft Skills/Knowledge	Course Candidates for CPE
Management & Operations	Languages (see above)	People Management/Supervisory Skills
Marketing Strategy	Career Planning/Personal Success	Tourism Marketing Strategy
Sales & Personal Selling	Work Readiness (4th year)	E-Commerce/Tourism Distribution Systems
Revenue Analysis	Taking Initiative/Working Independently	E-Marketing/Social Media Marketing
Accounting	Customer Care	Tourism Revenue Analysis
Labor Law	Leadership & Supervision	Managing Multiple Priorities
Food Safety	Communication (verbal & written)	Advanced, Professional Language Skills
First Aid	Word/Excel	
Ticketing Systems	Attitude/Realistic Expectations	
	Personal Grooming	

Note: Does not include vocational skills, which tend to be available and re-trained upon hiring

2.7 Employer perspectives on electronics WFD

As with tourism, we re-state COMET 2016 key LMA findings (COMET, 2016) and proceed to add context and detail with our findings:

- Nearly 70% of firms in the region, and across sectors, report planned hiring.
- 56% of employers in the region find staff through personal networks, receiving an average of 15 applicants per position.
- Employers are looking for interpersonal (40%), communication (43%), teamwork (46%), adaptability (46%) skills.
- 60% of employers think their employees need additional soft skills training upon hiring.
- 90% of employers claimed their managerial positions require technical skills, also citing cross-cutting skills in computer and English as important.
- Bachelor degrees are increasingly important; with 73% of employers requiring one for technical jobs and 94% for managerial jobs.
- A majority (72%) of surveyed employers indicated that they do not have gender preference for their positions. Yet, fewer females overall are hired as full-time/part-time staff, or as technical or managerial staff in comparison to their male counterparts.

- The composition of the tourism workforce is 45% female and electronics workforce 58% female, though this varies greatly by country, with Vietnam leading in gender equity.

2.7.1 Finding, training, and retaining employees

Activities to find new employees

Third-party online job boards and company websites are by far the most common ways electronics companies reach out to job seekers, and whenever possible, promotion from within is the norm. Personal connections are also commonly used and were mentioned more openly than by tourism respondents. In fact, it is not unusual to ask employees to tap into their personal networks and then refer interested candidates to managers for possible interviews. The COMET LMA indicated that 56% of all the companies surveyed used personal networks to find candidates. This finding was further echoed by EIs, many of which noted the important role played by alumni in securing jobs for current students. Recruiters are generally only used as a last resort, and they are not actively sought out for the same reasons as those indicated by tourism providers, i.e., high cost and low added value. Although they were not among the top three most-common responses, **electronics employers do use direct connections with universities and vocational schools to recruit new employees and do so more often than their tourism counterparts. However, as with tourism employers, such contacts are rarely made through career centers and instead primarily include direct contacts with specific people in academic departments of interest.**

Brand identity is an important factor in attracting new electronics employees. Many of the electronics firms interviewed were of reasonable size and operated with several hundred local employees. However, unless they possess brand identities in the realm of Intel or Western Digital, they often struggle to attract new employees, especially when in direct competition for recruits with branded companies. **As a result, some companies have become rather inventive in their attempts to brand themselves among university professors and their students, which has generally drawn them closer to EIs than most companies in the tourism industry**.

Training and retaining employees

As with tourism, training regimens in electronics are extensive and sophisticated. Naturally, the larger MNCs are at the forefront of training technology and use, and online interactive portals allow employees to learn at their own pace. Many generic technical topics are addressed (sometimes with trainers as well), such as International Organization for Standardization (ISO) quality assurance, various sciences, statistical process control (SPC), 6 Sigma, and lean manufacturing, most of which are apparently new to many recent graduates. This finding reflects the commonly noted problem that graduate engineers are exposed to

> **"More practical education plus soft skills development are needed on the part of university programs. Technology industries require a heavy dose of hands-on practice and lab usage. Now only 40% of what students need to know comes out of university, the remainder has to be self-taught and picked up on the job."**
>
> ***Electronics multinational manager, Phnom Penh***

rudimentary and, sometimes, advanced sciences but not in an applied form. Moreover, modern quality assurance methods and the integration of SPC are weakly addressed, if at all. Depending on the nature of each EI's curricula, some of these topics may be addressed more practically in their business programs, suggesting that cross-registration be encouraged between academic departments.

A substantial number of nontechnical but core skills are also addressed using internal training resources: sales skills, proposal writing, English, marketing, and management were all frequently mentioned. As with tourism, the number of days spent in training varies greatly depending on company size/resources and the level of the staff to be trained. However, systematic staff training was described as being implemented by virtually all respondents, as would be expected for an industry in such rapid and continual change. One week of training per employee per year appears to be approximately average.

In terms of employee turnover and its potential to reveal labor market failures, turnover figures were most often cited as being in the 1% to 5% range, although some respondents reported higher rates for technicians and other line staff, exceeding 10% in some cases and occasionally as high as 25%. As for tourism, lower-paid workers generally exhibited higher turnover rates, largely because they have less of a career to lose and tend to feel more mobile than higher-salaried employees.

The reasons for turnover essentially mirror those articulated by tourism employers, thereby validating each other, at least from the perspective of educational and cultural issues. In the case of electronics, the situation is further complicated by the speed at which technological change is occurring (addressed in a forthcoming section). Electronics employers complain about the lack of skills possessed by recent graduates and about the industry practice of poaching each other's employees. The general impatience of youth was also noted as an issue. Moreover, turnover tends to increase when inexperienced employees are first exposed to training, suddenly feel overconfident about their skill levels, and then seek higher salaries.

The brand identity issue that affects companies' ability to attract workers is also a factor in turnover because when Intel or similarly well-known firms place job notices, smaller companies see immediate departures at multiple organizational levels. As for tourism companies, despite the fairly frequent reports of high turnover rates, employers do not admit to being overly concerned, irrespective of the need for re-training.

Implications for finding, training, and retaining employees: Electronics

- Once again, university and vocational career centers are not routinely used or trusted. In contrast, electronics employers exhibit a more organic predisposition to reach out to specific university academic departments when a need does arise. The fact that this behavior is happening, albeit with little structure, suggests that universities and vocational schools could expand their cooperation with the electronics industry with minimal effort on their part. Assigning EI departmental employees to fulfill industry liaison roles while further promoting industry coordination would not overly strain scarce EI resources. On the contrary, such efforts could help leverage new resources from the

private-sector side. For instance, reaching out and encouraging companies to conduct branding sessions with students and staff, as lesser known companies are doing now, can easily be developed into more technically oriented seminars, thereby benefitting students and faculty alike.

- Similar to tourism, electronics employee turnover is not acknowledged as a significant industry problem, although the rates indicate otherwise. This issue is partially attributable to the attitude problems and weak soft skills characteristic of young employees. Thus, the implications are the same for the electronics sector as for tourism and may be addressed via practical life/social/career planning curricula inputs to primary, secondary, and post-secondary EIs (see *Table 2* in section 2.6.2).

- Furthermore, regarding the attitude issue of young employees, if EIs were to position themselves as generating more well-balanced, work-ready students who are cognizant of the patience required to build a career, employers will line up to secure their graduates. This is not an impossible task, and the primary step to achieving it is to make life-skills-oriented courses required for graduation.

2.7.2 Hiring needs and preferences for gender, skills, and education

Hiring needs and preferences

As for tourism, most interviewees did not indicate that large numbers of employees are urgently needed or likely to be needed in the near future (within two years). Two-thirds of the companies surveyed did anticipate some modest hiring in the range of 5 to 15 people each. One outlier, a large MNC, anticipated hiring 100 data analysis employees and 200 skilled technicians in the coming year. In fact, these two positions highlight a significant trend reflecting the growth in automation and robotics. Skilled line technicians who have assembly/soldering/machine maintenance experience and training are likely to be hired in the greatest numbers. Additionally, data analysts trained to understand the information captured by automated machinery and robots will also be in demand.

Herein lies the disconnect between the graduates EIs are turning out and industry's stated requirements. Many graduates emerge every year with engineering degrees. However, the number of engineers hired is relatively small because most product engineering occurs outside of the country by parent firms. Indeed, the assembly operations in Lower Mekong countries focus on just that: assembly. Thus, most of the design, engineering, and innovation were previously undertaken elsewhere, leaving only minimal value-added operations in production and assembly, which mainly require technicians. This is not to say that people should abandon engineering degrees. On the contrary, **if the electronics industry in the three countries surveyed is to mature and contribute to its hosts' economies, it will need to achieve higher levels in the VC. Otherwise, MNCs can always turn to other lower-wage markets. However, in the meantime, skilled technicians are more in-demand than engineers.**

Beyond technicians and analysts, electrical engineers were the next most often cited as needed in the coming two years, although the total number mentioned by those surveyed was only

approximately two dozen. Industrial engineers, software designers, and quality assurance/testing specialists were also mentioned on the technical side, but again, only a handful of each were speculated to be needed. These modest numbers of expected new hires are somewhat validated by the responses to the pre-survey question concerning low expected growth in overall employees. **This situation likely reflects the accepted reality that without substantive changes to domestic industry structure, including increased value-added design and production activities, the need for significant expansion in production capacity will be diminished.** It also highlights the problem encountered by several universities offering electronics-related programs: they are discouraged from training students in higher value-added functions because they fear that graduates will experience difficulty finding employment.

Among non-technical new hires, salespeople were indicated as being needed in the near future by a few companies, as were director-level recruits (mentioned by the head of a technology center answering on behalf of the industry as a whole). These last two positions are significant because they were raised in connection with the need for integrated skills, namely, employees possessing supervisory, strategic, and technical skills, which is not dissimilar to the need for multi-faceted managers raised by tourism interviewees.

> **"Don't give me people with master's degrees; they come in with an attitude – terrible! They are just not to the same standard as people with graduate degrees from institutions abroad."**
>
> *Electronics manufacturer Manager, Phnom Penh*

In terms of education levels, a university degree is required for any type of engineering position, including electrical, software, and process jobs. The same conclusion generally holds true for managers as well. Interestingly, no one indicated a preference for post-graduate technical degrees; in fact, one manager with a small company viewed such degrees as tremendously negative attributes. Technicians, in contrast, were overwhelmingly preferred to have vocational degrees. **These preferences differentiate electronics from tourism: electronics employers are more emphatic about the need for university degrees and vocational certificates.**

Regarding required experience levels, less concurrence was found. Approximately half the respondents desire employees with experience, generally preferring to hire those with two to three years of experience. Certainly, experience plays a role in electronics hiring decisions more often than in tourism.

Similar to the tourism sector, gender preferences are not typically transparent. However, if the numbers can be believed, at least among the respondents to this survey, female employees outnumber males by a considerable margin. Indeed, the respondents reported that approximately three-quarters of their employees are women. These numbers are skewed by several large MNCs claiming gender balances of 68%, 78%, and even 90% female. If several outliers are added back, the number of female employees jumps to over 80% among survey respondents. The COMET LMA determined that female participation in the electronics industry throughout the Lower Mekong was 58% of total employment. This value is probably closer to reality and reflects the inclusion of more domestic/smaller enterprises in their sample population. **Clearly, electronics firms hire more than their share of females, making them an attractive industry to support**

with regard to gender-balanced economic growth. However, a less-positive picture emerges when considering the numbers of female managers, with the proportion dropping to less than 40%, reported by those who were willing or able to answer the question.

Few gender barriers were acknowledged, and indeed, aside from an apparent glass ceiling, the overall number of female workers is high, as corroborated by secondary research. One person admitted that women can be less free to travel on business because of safety concerns, especially in remote areas of the country. Another referred to situations in which heavy objects needed to be carried on the shop floor and the ensuing preference for male technicians. One company outside the capital city (with less than 50% female employees overall and no female managers) specified a lack of female job seekers because of their remote location. However, this argument seems somewhat spurious given the company's location in a large technology park within 40 minutes of the city center.

Skills in short supply

As touched on in the previous section, similar to tourism, the most difficult-to-find recruits in electronics are front office managers, production managers, and marketing/sales people with a strong combination of multidisciplinary skills. Specifically, these include managerial skills, technical skills, strong language skills, and strategic knowledge of the industry. Finding individual candidates with all of these characteristics can prove challenging for employers. Thus, **graduates coming out of universities with specialized skills may be, in fact, too specialized, lacking the multidisciplinary knowledge and skills many employers seek.**

> **"It is possible to find Production Managers with strong technical skills but they usually lack another language and the ability to supervise others."** *Manufacturer, HCMC*
>
> **"I can find salespeople with good selling skills and strong people skills but they don't have a thorough technical understanding about what they are trying to sell."** *Manufacturer, Phnom Penh*
>
> **"Product managers need to design from the R&D level up to a commercial product. This means they need strong technical design skills but also a thorough understanding of the market. These are hard to find in one person."** *Techno Center, Bangkok*

Conversely, **graduate engineers, who are specialists by nature, are thought to lack critical depth in core areas crucial to their performance. Courses in statistics and probability, material/metallurgical properties, physics, chemistry, and other sciences are required and completed courses, but among new graduates, applied knowledge in these areas is virtually nonexistent.**

Problems with soft skills were also, once again, given considerable weight. Clearly, all three countries surveyed urgently need assistance to strengthen job seekers' soft skills. The same types of skills were singled out as in tourism, though in some cases, the order of severity varied slightly. The soft skills identified by electronics managers as most critical, in order of importance, included the following: professional-level English, problem solving/independent thinking, leadership/supervision, verbal and written communication, and of course, attitude.

Reasons for skills shortages

Again, the reasons underpinning the shortfall in soft skills are thought to emanate from a mixture of societal and educational factors. Language and communication clearly need stronger support beginning in primary school in combination with increased emphasis at the university level. More broadly, an educational realignment should be initiated that involves less rote learning and more creative, interactive educational processes. **Leadership, social interaction (people skills), constructively challenging authority, and especially problem solving would evolve more readily if such an interactive, creative reorientation can be implemented in primary and secondary school and especially at the university level.** One Bangkok-based, government-supported institution conducts annual robot-building competitions to engender teamwork, creativity, and applied technical skills among electronics industry graduates. They recognize that these are precisely the types of soft and applied skills that too frequently evade university electronics graduates.

Implications for hiring preferences for gender, skills, and education: Electronics

- Hiring needs in the near term are not significant concerns among the companies interviewed, despite continuing strong industry growth globally. Skilled technicians, not engineers, are most consistently in demand because of the labor-intensive, low-value-added nature of the Southeast Asian electronics sector. The existence of relatively few strong vocational schools, which is partly attributable to the transformation of many into universities, is out of step with industry needs. This is particularly true in Cambodia where the vocational educational sector is seriously underdeveloped. Assembly, soldering, machine maintenance, and other technical skills are needed as vocational core skills offerings.

- Electronics employers are emphatic about wanting degrees for engineers and managers and vocational certificates for technicians and skilled line staff. This preference opens up continuing opportunities for EIs in electronics and is not always the case in tourism programs. The main shortfall in electronics is the lack of applied, practiced knowledge and skills, which is a result of the clear shortfall in the present state of EI programs.

- Overall gender equity is generally strong, with some companies even favoring women. However, women are less common at the managerial level, with their proportion not likely exceeding 40%. Universities have a role to play in supporting change going forward. Required curricula on the importance of gender diversity at all levels in an organization and its contribution to the strength of the private sector and the country as a whole are well advised. Strongly encouraging women to engage with managerial curricula is also needed.

- One of the most significant challenges facing EIs in the near term is altering their curricula to imbue graduates with practical cross-cutting skills and perspectives. Managers, in particular, need a well-rounded combination of skills to be effective, including supervisory, technical, and language skills and strategic knowledge of the

industry. Currently, the industry feels that the curricula are too narrow, offering little chance to achieve a balanced perspective.

- Engineers and technical people are graduating with the usual course requirements completed but scarce practical and applied knowledge in critical areas. Indeed, statistics and probability, material/metallurgical properties, physics, chemistry, and other sciences are reportedly weak among new graduates. Industry should be encouraged to work with universities and polytechnics to increase hands-on pre-graduate work and applied learning. Such collaboration could take the form of expanded work-study programs, upgraded lab facilities, and the usage thereof.

- Soft skills are weak, and specialized curricula should be required for graduation. Following the lead of the Bangkok-based technology center, EIs may be assisted to organize activities, such as robot-building competitions, that foster creative approaches to problem solving while interacting with others on a team.

2.7.3 Overcoming skills gaps and the role of educators

Methods to train people and overcome skills gaps

As for tourism, on-the-job training, in-house short courses, and off-site training are the usual methods applied to upgrade employee skills, and all are common. Some companies even engage in regular monthly training, such as by offering classes one Saturday per month, to maintain a learning mindset among their employees. Most also put a premium on good HR practice, in many cases imported via parent companies or influential MNC customers.

Very little industry-driven collaborative training is performed. Instead, most firms simply use their own resources to train people. Associations are not particularly functional and tend to lack credibility among industry players, as found for tourism. Again, if association(s) can be found that accept a strong educational mandate to link industry with EIs, some institutional capacity building (of the associations) may be advisable. This is not to suggest the establishment of private-sector associations but, rather, strengthening those with existing capabilities that are willing to take on the liaison role. **In cases where association/chamber management groups have pre-existing core capacity, they may be empowered to play the role of an honest broker, bringing multiple parties from industry and academia together to strengthen workforce skills, especially if EIs are also represented in the associations themselves.**

In some cases government, especially in Thailand, has attempted to fill the void in private-sector (association) and EI short-term training activities. This issue was directly addressed during an interview with the Bangkok-based BOI, which helps link EIs with industry and coordinates with other state-run institutions (the National Science Development Agency, NECTEC, Software Investment Promotion Agency, and Science, Technology and Innovation Office) to offer research and some technical training. They are also supporting one private BDS group (the Thai Embedded Software Association) in a training role and are attempting to encourage a shift toward higher-value-added manufacturing.

Industry linkages with EIs

As mentioned previously, **linkages between the electronics industry and EIs are more prolific and widespread than they are within the tourism sector. However, as with tourism, the linkages are not systematic, either industry-wide or country-wide, and are based on the wills of individual company managers and university/TVET professors.** Whereas tourism operators are more likely to have established linkages with TVETs, electronics firms have devoted more energy forging linkages with universities, mainly due to an evolving interest in graduate engineers (though the new grads may end up as technicians). This is likely the reason, at least in the electronics sector, there are more lecturer exchanges with universities than with TVETs (elaborated on later in this section). And they occur in both directions, electronics firms' managers teaching in front of classrooms and professors conducting seminars at companies. These exchanges, naturally, also have a positive impact by way of the curricula that is shared with the universities.

Of course, there are always exceptions. One internet services provider downplayed their linkages with universities in favor of their work with TVETs, explaining that in their experience, TVETs were better equipped to impart communication and critical thinking skills for their employees.

Internships and cooperative education are the other most common forms of collaboration and offer considerable opportunity for industry employers eager to *get to know* candidates before proceeding with the hiring process. Employers seek out candidates with high grade point averages for inclusion into job-learning schemes and then evaluate them in practical situations. In Thailand, especially, it is common to select students after their second year of study for extended in-company practical work assignments, focusing more often than not on a single project for maximum realism. Although the employers interviewed appear to see value in these arrangements, and believe they are also instructional for students, the university perspective is frequently different. Too often, their perceptions suggest the student internship experience is less than useful and may include activities convenient for employers but unsuitable for learning, e.g., making coffee, running errands, and photocopying documents. The reality likely lies somewhere in between and varies on a case-by-case basis. Without clear student perspectives, the value of these experiences is difficult to gage.

Effective Industry and University Cooperation

One company working in the telecom equipment sector in Cambodia has undertaken a progressive approach to upgrading employee skill levels while doing their best to work in tandem with and build capacity in universities. A senior manager from this company explained:

"To recruit technical people, we go directly to technical departments in the faculties of interest to us within several universities; we skip the career centers, which are not helpful. We discovered that we need to do a lot of corporate branding at universities, because compared to some in this industry we are quite small and unknown. So we visit technical departments regularly to raise awareness among professors and students about who we are and what we do, in hopes of making them interested in us as a possible future employer. We also encourage engineering students in their final year to visit our factory.

"Soft skills are an issue for us. We have tried talking to universities about the need to graduate engineers, for instance, with soft skills. When they are new they just don't understand much other than their technical area. They are terrible doing paperwork or just adhering to company policies and admin systems. The finance people have a real problem with them because they can't even keep track of their expenses during business travel.

"There is also a mindset problem which is cultural. People are taught not to challenge authority, to be quiet and accepting. Some universities are trying to address this through teamwork, group exercises, and other interactive activities but more needs to be done and such training should be a requirement to graduate.

The most important program we have undertaken to address the need for better qualified graduates is something we started four years ago. The fact is educational institutions don't come close to keeping up with changing technical needs in our sector. To remedy this we established training labs at four universities, which have helped both sides tremendously. The labs are housed in university facilities but equipped by our company with the kinds of instrumentation we use here in our plant, albeit on a much smaller scale. Students are taught assembly techniques, production processes, and even quality assurance and testing methods. We get stronger candidates for employment and they [universities and polytechnics] improve curricula and reputations. Another thing we have done in this regard is focus our closest cooperation and assistance on institutions that don't receive support from elsewhere – a polytechnic and three universities with electronics technology departments are our main targets at the moment. This type of program can and should be expanded."

Job fairs were less commonly cited as valuable to the industry, but a small number of electronics companies did indicate annual attendance when possible. Their attendance is intended to help brand the companies in the eyes of students and EIs as much as it is to actually (then and there) recruit suitable candidates for employment. Again, career centers are generally overlooked because of a lack of perceived effectiveness in favor of direct contacts with academic departments.

The use of industry workers as guest lecturers at universities and, conversely, professors conducting seminars for industry, while not commonplace, occasionally occurs in Thailand and Vietnam. No examples were cited by Cambodian interviewees. Both of these findings were corroborated by EIs. Finding professors to conduct seminars on specialized topics for industry, such as physics refresher courses for engineers or C++ programing for new employees, can be challenging, but it is possible. Unfortunately, however, the university system is often misaligned and does not incentivize faculty to engage in consulting or training on top of their already overloaded teaching schedules. Most such engagements involving professors consulting at the company level are initiated by the private sector; they are occurring, though nowhere near as frequently as in regions with more advanced practices.

In some cases, evidence does suggest that EIs are reaching out to the private sector to better understand their needs. The Open University in HCMC, for example, recently invited the Vietnam Chamber of Commerce and Industry to attend an annual meeting to discuss curriculum modifications. More EIs should systematically adopt such practices as routine, at least annually.

Company managers also offer curriculum-related ideas and/or guest lecture at universities, although again, this practice varies widely on a company-by-company and institution-by-institution basis.

In all of these cases, **the relationship between industry and EIs is too often ad hoc and unsystematic. The private sector is certainly partly responsible because of its insufficient coordination and apparent inability to speak with one voice when attempting to articulate its needs to universities and vocational schools.**

> **"We used to have an early recruitment program where we would connect to universities and find people between the 3rd and 4th years to hire. We did this to find good people, but just as importantly, to send a clear message to universities by hiring students with the most relevant combination of skills and educational background. We wanted to influence educators to guide students in these directions. We have since stopped the early recruitment program as we were just losing too many of the new recruits.**
>
> **"We also routinely offer universities suggestions how to improve curricula. Some even ask us what we need but it takes a long time for universities to change course and actually modify their programs. The other problem is industry is guilty of sending mixed signals about the skills they need, because most companies only relate their specific requirements – not those of industry in a broader sense. Worse yet, companies may not even hire many graduates with the skills they claimed they needed. Universities then become frustrated, making coordination more difficult." *Multinational Electronics Company, Bangkok***

Implications for overcoming skills gaps and the role of educators: Electronics

- While linkages between the electronics industry and EIs are more prolific and widespread than they are within the tourism sector, these relationships remain largely ad hoc and dependent on the efforts and wills of motivated individuals. In the absence of systematic collaboration between industry and academia, institutional capacity building of private-sector associations and chambers with active track records and strong management may facilitate bringing multiple parties from industry and academia together. Curriculum

design, expertise sharing, and collaborative training/lecturing can be strengthened with these associations' assistance. As a starting point, EIs should be encouraged to meet at least annually with the private sector to obtain conceptual and tangible inputs to their curricula. This will be an evolutionary process, and communication with the private sector should eventually happen virtually year around, as necessary.

- Related to the implication described above, industry must learn to speak with one voice, just as in government advocacy, when attempting to influence EIs to adopt new programs and curricula. This need further reinforces the requirement for stronger industry associations and chambers with a clear mandate for educational liaison and devoted staff to support this communication.

- Additionally, similar to the tourism sector, fostering the strengthening of individual university departments to adopt more of the placement role that is normally handled by career centers is encouraged.

- Using industry people as guest lecturers at EIs and, conversely, having professors conduct seminars for industry occurs most notably in Thailand and Vietnam, although it is not yet commonplace. Incentives are needed on both sides to further encourage this type of cross-fertilization. The implementation of foreign models would be invaluable, and in some cases, such models had been pursued by the institutions with which we spoke, particularly in Vietnam. Lower Mekong universities could benefit greatly from partnering arrangements with foreign counterpart universities, especially those with well-developed systems to engage academic staff in commercial assignments and private-sector lecturers at the university level. Such partnerships may be sought with EIs in areas with well-developed electronics clusters, e.g., Tech City (Cambridge, UK), Elcina (Rajasthan, India), and Silicon Valley (CA, US). There is no need to create these types of systems from the ground up.

2.8   EI perspectives on electronics WFD

2.8.1   Perspectives of electronics EIs on industry needs, curriculum orientation, and skill-building

The electronics sector's perspectives, which are, in many ways, uniform across the three countries (particularly with respect to collaboration with the private sector), exhibit some important distinctions between countries. These differences are partly attributable to the industry structure in each country. Thailand probably has the strongest indigenous base of firms, whereas Vietnam's is fairly weak (limited principally to public sector firms and large MNCs), and Cambodia's is limited to a few large firms that have established themselves in the country's SEZ and an indigenous sector that is, by and large, extremely small. Additionally, the educational system in each country has been influenced by the nature of the electronics work occurring in each. **Our report concludes that there may be an important misperception about the level of value addition taking place in each country, which has a significant bearing on the educational systems themselves. While Thailand clearly has the most-developed electronics**

sector in terms of total export value, the extent of the value-added work being performed in this country is only marginally more advanced than that in Vietnam. One university representative described this work as typically including some low-level design but principally consisting of assembly and packaging work. The export numbers may therefore be more reflective of the quantity, rather than the value-added level, of the work being done in each country. Meanwhile, Cambodia's sector is certainly the least developed. This is an important finding for our evaluation of the educational systems of each country. For example, Thailand's educational sector does not appear to perceive that its graduates have many opportunities in design and has, therefore, discouraged its (best) students from pursuing that field of study. Importantly, this behavior also affects that sector's emergence. An additional, notable point is that design work requires workers able to think creatively, and faculty in both Thailand and Vietnam noted that this ability is a weakness among graduates.

Common employers in Thailand included Western Digital, Philips (now NXP), AEG, AIS, Siemens, and mobile phone companies, such as DTEC and TRUE. A fair number of recruits also pursued opportunities with the Electricity Generation Company of Thailand and the Provincial Electricity Authority, both of which are public. A significant public-sector component was found to be involved in hiring in Vietnam and was greater than that found in Thailand, with many graduates going to either VMBT (telecoms) or EVN (electrical). One school estimated that 40% of its graduates went to public-sector companies. Of the private companies, popular options included Samsung (the most frequently mentioned), LG, Intel, Renesas, and Fujitsu; one school estimated that approximately 5% end up working abroad, generally when hired by a MNC and sent to its headquarters. A few are employed by the mobile phone companies as well (i.e., Viettel or Mobiven). Another notable incipient trend in Vietnam is students graduating from schools in Hanoi and moving to Danang, which features an emerging software design cluster. A much smaller list of employers was found in Cambodia, with the Japanese firm Minebea appearing to account for a large percentage of jobs. Both Samsung and mobile phone companies were mentioned as well, while Khmer Semiconductor (a joint venture with Japan), which employs a dozen workers, was the only firm to come up in the context of design. Many students seem interested in telecommunications rather than the electronics field.

The shortcomings that EIs perceived in their ability to deliver better value to their students included (1) shortcomings in the practical orientation of the programs, which in Thailand was attributed to the requirements of the Council of Engineers; (2) a need for more in-class projects to bridge the gap between universities and the private sector; (3) additional language training in both English and other languages, such as Mandarin; (4) a need for further soft skills development in TVET graduates (this concern was voiced principally in Vietnam); and (5) a need for more internships to provide a practical dimension to the training (in Cambodia).

Upgrading both the technologies employed in university classrooms and the equipment used by TVETs is particularly needed, especially in Vietnam, which has the most robust TVET sector. In electronics, perhaps the most relevant need at the university level is to increase the use of simulations in the classroom, which occurs in a few schools but is by no means widespread. At the TVET level, however, educational technologies are arguably less relevant

than the modernization of the training equipment. Indeed, while some TVETs in Vietnam that benefited from significant funding from the state boasted state-of-the-art equipment, others were training on extremely dated technologies; for example, one institution with which we spoke was using CAD/CAM machines that they estimated were 15 years old, whereas another was training on equipment that dated back to the mid-1990s. In both cases, the schools noted that they had received feedback from employers that between two weeks and two months of re-training was usually necessary to prepare their graduates to be productive contributors.

2.8.2   State of private sector-EI collaboration

Placement offices: As for tourism, **placement offices are uncommon in electronics, and most placement, to the extent that it happens, occurs through faculty rather than a formal placement office. Where they do exist, they are not proactive, acting in a principally passive role in identifying job opportunities and preparing students for those opportunities**. In one particularly extreme example, a TVET school in Cambodia actually had a policy against companies recruiting at their school. Some creative attempts have been made to compensate for the sub-standard placement offices; for example, at one school, alumni formed a group that functioned as a placement association, and in other cases, alumni have played more informal roles in helping graduating students locate jobs.

> **"We train for all companies, not for just one."**
>
> *-Cambodia Electronics TVET Representative explains why he recently rejected a company's petition to recruit on the grounds of his school*

Private-sector involvement in curriculum development: **Private-sector involvement in the curriculum is limited in Cambodia, Thailand, and Vietnam**. However, the root cause differs somewhat from country to country. In Thailand, the university curriculum is set by the Council of Engineers, which leaves very little space for innovation. As a result, some institutions feel there is little point in incorporating private-sector actors. For those who saw some value in their involvement, any interaction generally occurred through informal channels (usually faculty or alumni). The situation is similar in Vietnam, where most interaction happens via informal channels. However, many EIs were bound by the common, government-mandated curriculum, which provided little flexibility. Now that the common curriculum at the university level has been dropped, this area is ripe for innovation because Vietnamese schools of engineering are not subject to the mandate of a higher council, as their counterparts in Thailand are.

> **Applying Good Practices: Curriculum Development**
>
> **One university we engaged with in Vietnam had entered into a partnership with Samsung. Under the terms of the partnership, Samsung developed a specific course of study for exceptional students who are interested in a career at Samsung. This course, which teaches students skills highly specific to Samsung's needs, may be taken as an elective.**

It is also worthwhile to note that multiple universities in Vietnam indicated that they had borrowed curricula from abroad. This idea was encouraged by the Higher Engineering Education Alliance Program in Vietnam, which has advanced the design of curricula aligned with the Accreditation Board for

Engineering and Technology (ABET). Such curricula tend to be well-viewed by foreign companies, for which ABET accreditation serves as something of a "stamp of approval." Ho Chi Minh City University of Technology was just accredited under ABET, making it the first in Southeast Asia to achieve this. Although curricula were generally obtained from US universities, in one case, a university in Vietnam borrowed curriculum from Chulalongkorn University in Thailand. In Cambodia, the private sector plays no effective role in curriculum development. Instead, universities in Cambodia tend to look to other (foreign) universities, whereas vocational schools/polytechnics tend to borrow their curricula from schools abroad and from donors (i.e., JICA).

Internships: Internships are required at most universities in Thailand and Vietnam (as indicated by 73% of respondents, with the balance indicating that they were strongly encouraged)**. However, they are not facilitated by the schools, leaving students, for the most part, to find their own**. **As a result, nearly all internships require drawing on personal networks. In Cambodia, internships are generally not required, and the number of students who participate in them is low.** However, the private sector is exhibiting continued interest in increasing access to interns by the private sector in Cambodia.

Links between faculty and private enterprises: **Some training of businesses by faculty is being conducted in Thailand and Vietnam**, with one university in Thailand noting that it felt training was part of its mission. Another, however, indicated that there were limitations on its ability to conduct trainings because of scarce teaching resources and the fact that many companies feel they can provide the training better themselves. In Vietnam, some training is being performed by TVETs, with one mentioning that it attached value to the two-way transmission of knowledge and the benefits that accrue to faculty through this experience. However, it was somewhat more common to find relatively high levels of collaboration in R&D, especially in Thailand, than for educational purposes. **In Cambodia, little to no faculty involvement in training businesses exists, and the prospect of that situation changing seems distant at the moment.**

Use of private-sector lecturers in class: This situation is similar to that in tourism faculties: Guest lecturers are most prevalent in Thailand, used occasionally in Vietnam, and are rare in Cambodia, where visits tend to be recruiting events rather than knowledge-sharing opportunities. In the latter case, it is at least as common for schools to host visits by government agency representatives as it is to host private-sector representatives.

Projects co-sponsored by companies: The popularity of company-sponsored class projects is increasing in both Thailand and Vietnam. Typically, a company will assign projects that it lacks the resources to devote to itself. While projects (or theses, as capstones) are typically part of the curriculum in Cambodia, they tend to consist of short observation periods for students followed by a write-up that summarizes what they learned rather than company-sponsored projects.

Number of faculty with private-sector experience: Interviewees noted that faculty with private-sector experience teaching in universities in Thailand and Vietnam typically constituted less than 10%, although this number was much higher (typically over 50%) among TVET faculty (especially in Vietnam). In Cambodia, the number of university professors with a private-sector

background is much higher, but these professors generally appeared to gain this experience by owning their own business and teaching part-time.

> **Applying Good Practices: University-Industry R&D Collaboration**
>
> **Silicon Craft, based in Thailand, has engaged a number of universities offering IC design courses (or that have faculty with that expertise) in collaborative R&D. Participating universities include Kasetsart University, Chulalongkorn University, King Mongkut's Institute of Technology Ladkrabang, King Mongkut's University of Technology Thonburi, Mahanakorn University, the Asian Institute of Technology, Prince Songhkla University, King Mongkut's University of Technology North Bangkok, Chiang Mai University, Khonkaen University, Thammasart University, and Walailak University. Such efforts can lead to broader industry-university areas of collaboration.**

In addition, while not really a specific "touch point" in the sense that it does not provide an immediate benefit to students, university-industry collaboration around R&D activities can also strengthen the links between universities and the private sector. One such example in Thailand was initiated by Silicon Craft (see inset). An important obstacle to additional efforts in Thailand is its law with respect to intellectual property (IP): Any inventions produced via government-funded R&D remain the property of the government. This differs, for example, from that in Vietnam, where such IP becomes the property of the inventor, providing an incentive for the inventor (generally the university) to engage the private sector around opportunities for commercialization. In Cambodia, neither sufficient R&D nor a sufficient IP framework exists for such initiatives to be expected to emerge any time soon.

2.9 Employer industry trends and expected electronics workforce needs

2.9.1 Industry product and demand trends impacting future skills requirements and hiring practices

Whereas advancing technology is affecting most industries, as described in the parallel section on tourism trends, nowhere are technology developments altering the landscape as quickly as in the electronics industries themselves. For electronics, change is the driver of increases in market share and growth.

Each of the surveyed countries is at a marginally different stage in the maturation cycle. Thailand is clearly the most advanced in terms of its operating history and the outputs and quality levels it has attained. In fact, Thailand has achieved a second-place world ranking for operational excellence in hard drive production. Vietnam is rising quickly, and some industry executives in Thailand even profess a degree of nervousness about their neighbor's growing influence. Cambodia, too, is increasing its electronics exports annually and is looming large in MNCs' plans for assembly operations. **However, the problem faced by all three countries lies in this trend: each is characterized by abundant assembly operations and little else. Components are assembled into hard drives and other accessories, mainly from imported subcomponents, all of which were designed and prototyped elsewhere. First-tier suppliers for the large MNCs, such as Seagate, remain mainly composed of other internationally**

owned companies that simply follow the big boys around the world, setting up nearby subassembly operations. At the second-tier supplier level, most notably in Thailand, some indigenous companies exist, but they handle very basic operations, e.g., *"...a Thai company prints the packing slips and labels for us."*

Overall, virtually no domestically owned companies exist in any of the Lower Mekong countries that directly manufacture subcomponents for the electronics industry. Additionally, those that do exist simply produce others' IP for them. Electronics industry stakeholders in each country are aware of this and are concerned about the long-term consequences if the present course continues:

- Each will be stuck in a vicious circle wherein the only benefits will be basic employment for low wages. When another country, such as Myanmar or Laos, offers yet lower wages and other incentives, the existing countries may be gradually abandoned by the MNCs.

- This situation virtually ensures that wages will be forced to remain at an artificially low level unless higher-value-added processes can be offered and incorporated into domestic operations.

- Because the existing value-added is low, the domestic capture of revenues is also low, and most leave the country with the exported goods.

Escaping from this trap involves taking on more value-adding processes ranging from design to prototyping to quality testing. The existing margins for basic assembly have decreased to near 2%, whereas the margins for design are closer to 30%. Therefore, the incentive to upscale is clear. The problem is the lack of experienced and qualified people to handle such operations. Inertia also exists that could prove difficult to overcome to transform a country known for assembly into one where product design occurs.

In addition to the ubiquitous low-value-added production situation, four main trends were identified as shaping the future of the electronics industry in Cambodia, Thailand, and Vietnam.

The first is related to the above discussion and includes a move toward original design manufacturing (ODM) from original equipment manufacturing (OEM). **Assuming that engineering design skills and facilities can be up scaled, ODM appears to be a viable aspiration, particularly for Thailand and Vietnam. ODM means that a greater share of value is added (in-country) because an original design is incorporated into the domestically manufactured product.** The continued production of others' designs simply does not bode well for the progression of domestic electronics industries when there are always lower-cost labor markets ready to emerge. **Engineers in Cambodia, Thailand, and Vietnam know how to efficiently assemble products but too often lack the physics, chemistry, and materials/properties knowledge to work further upstream in ODM.**

The second trend is precision manufacturing, which is growing rapidly as products become more automated and/or smaller. Currently undertaken mainly by relatively developed countries, such as Korea and India, there is no reason why higher-precision, higher-tolerance manufacturing of micro components for, e.g., tiny actuators and motors cannot be done in the

Lower Mekong. The means to initiate such manufacturing involves country-by-country incentives for MNCs to establish local, high-precision assembly processes, thereby helping develop the indigenous skills necessary for similar operations to be expanded more broadly. **The long-term viability will depend on the increased availability of precision tool and die specialists and more skilled engineers/designers.** In turn, this will, in part, rely on the following pre-condition: the availability of state-of-the-art precision machinery to enable training to take place. One company is now importing virtually all of its precision tool and die people from India, which should not occur.

The third trend is the so-called internet of things (IOT), a catch-all phrase describing the connectivity of networked physical objects into smart phones and mobile platforms, allowing e-commerce, remote controlling, and even the monitoring of smart houses. This trend requires more skilled software engineers and others able to cope with the sophisticated networking systems required for IOT functionality.

Finally, the fourth major trend is the ever expanding field of automation for robotics and sensor-driven devices. Automation creates the need to integrate electronics engineering knowledge with mechanical engineering in, for example, the design of robots for manufacturing. It also requires more skilled technicians to operate and service the machines and data analysts to extract and interpret data from them.

Implications for industry trends impacting future skills requirements: Electronics

- Very few locally owned companies are involved in the electronics industry directly, and those that are simply produce the IP owned by others. With many low-labor-cost countries potentially waiting to emerge, the electronics industries in Cambodia, Vietnam and Thailand (especially in the latter two) must differentiate themselves and upscale their operations to offer more added value in the following areas:

  − ODM, with much greater design input;

  − Precision manufacturing, to high tolerances for machines and micro components;

  − The IOT, software design for networked devices and sensors; and

  − Automation, with the integration of electrical and mechanical engineering.

- The message to local industry is clear: Add intellectual capacity or be relegated to competing at the lowest wage levels until another lower-cost country moves in. Then again, even existing attempts to compete at low wage levels are rapidly becoming nonviable for Thailand, which will be forced to upscale more quickly.

- The implications for universities relate to whether they will remain relevant or not. To remain relevant means that programs in electrical, mechanical, and software engineering and design need to be brought up to world standards. If they are not, companies will continue training their own people (only) and importing urgently needed skills. At best, they may be able to transform themselves into higher-value-added operations, and at worst, they will gradually relocate to lower-wage countries.

- The implications for vocational training centers are similar to those for universities. For these centers, remaining relevant means upgrading their equipment to train people with precision tool and die-making skills and the quality assurance mindset that goes along with these processes.

2.9.2 Electronics industry: Articulated needs for skills and knowledge

Table 3 summarizes the responses to questions designed to **identify the types of skills and knowledge that industry interviewees are most concerned with now and in the foreseeable future** when seeking new employees. The first two columns represent the skills and knowledge they most frequently seek and/or have difficulty finding in new recruits. The last column is intended as a natural extension of the first two columns to guide EIs regarding possible courses to offer through CPE programs.

Table 3. Electronics Skills and Knowledge

Hard Skills/Knowledge	Soft Skills/Knowledge	Course Candidates for CPE
Statistics and Probability	Leadership	Management and Supervision of People
Material/Metallurgical Properties	Problem Solving/Independent Thinking	Professional English
Physics, Chemistry, and other Sciences	Social Interaction (people skills)	Marketing Strategy
Management/Supervision	Communication	Sales/Personal Selling
Sales	Attitude/Realistic Expectations	Managing Multiple Priorities
Industrial Engineering	Career Planning/Personal Success	ISO Quality Standards
Software Design		SPC
Quality Assurance/SPC		6 Sigma/Lean Manufacturing
6 Sigma/Lean Manufacturing		Physics, Chemistry, and other Sciences
Data Analysis		Precision Tool and Die Making
Proposal Writing		
Precision Tool and Die Making		
Assembly/Soldering		
Machine Maintenance		

2.10 Gender dynamics at TVETs and universities

Gender dynamics in the two sectors at the university/TVET level are a study in contrasts. In tourism programs, women predominate. Indeed, we were unable to find a program in which women accounted for fewer than 50% of

> **"We don't need more women; we need more men."**
>
> *-Tourism School Representative, Thailand, when asked about gender balance in their tourism program*

all spots, and they typically comprised 55% to 80% in Thailand and often between 70% and 90% in Cambodia.

In electronics, however, the picture differs dramatically. In our interviews of electronics faculty at universities, most estimates of women's participation ranged from 10% to 15%. At the TVET level, the situation was even worse, with women generally making up 5% (often as low as 1%–2%) of the workers. It appears that a myriad of reasons contribute to what is effectively a regional phenomenon.

> **"Girls aren't valued here either in employment or in study."**
>
> *- Electronics TVET Representative, Cambodia*

In Thailand, this discrepancy was attributed to the fact that women tend not to study physics and math, which are prerequisites for the study of electronics. The same interviewee suggested that, in the past, parents did not want young women living in the dorms, although that is less of an issue now because public transport allows them to travel from home to classes. Another interviewee told us that the barrier is principally cultural and that women prefer fields such as civil engineering or telecommunications over electrical or mechanical engineering. In Vietnam, there is a social stigma associated with women studying electronics. Frequently, this pressure may come from parents, who encourage their daughters to study something "easier" that will require less time and provide more opportunity for raising a family. Many do not even realize they can study electronics; one professor in Vietnam told us that he had a female student approach him and ask if she was allowed to study the field. Children are also "tracked" in Vietnam starting around 7th and 8th grade; those who choose humanities do not take the necessary science and math courses to be successful at the university. Critically, in neither Vietnam nor Cambodia is adequate career counseling available at the high school level to serve as a counterweight to the social messages girls receive.

Ironically, our findings suggest a higher participation of female employees in the electronics sector than in tourism, at least among the surveyed companies. In fact, electronics respondents reported that upward of 75% of all employees are women, although women certainly remain under-represented in managerial and front office roles, failing to exceed 40% in either sector. Some of this apparent misalignment may be explained by the fact many entry level employees in both sectors are frequently untrained or under-educated, particularly in tourism. Additionally, many graduates do not, in the end, seek jobs in their field of study.

Anecdotally, however, we found that many of the women who do graduate in electronics rise into managerial roles; that is, while women are underrepresented in electronics programs, those who do get through them tend to achieve more on average than their male counterparts. For example, one school we met with in Cambodia indicated that most of its female graduates were in design work, including playing prominent roles in AutoCAD in Komen Kmai. This may partly explain their much higher representation in firms than we find in institutions. We have made some recommendations for greater gender inclusivity in the section on recommendations that follows.

3 Recommendations and Implications

3.1 Recommendations for COMET: EIs

- <u>Modeling/disseminating good practices</u>. There is a need for the modeling of best practices with respect to the seven "touch points" identified earlier in the report. This could be achieved by disseminating best practices or engaging in study tours. "Model" universities and TVETs that demonstrate best practices can be identified in each area. For example, with respect to the best practices in the ongoing incorporation of private-sector input, Dusit Thani in Thailand (the subject of the case study presented earlier) is a best practice example in tourism at the university level. The identified EIs can then serve as a model for actively engaging the private sector in everything they do: curriculum, placement, and private-sector work requirements for faculty. In Cambodia, Paul Dubrule is a model for practical training in TVETs, using on-site hotel rooms to mimic those in the major chains, for example, and providing a soft-skills orientation that complements the technical education it delivers. Both have their origins in private-sector chains, with Dusit Thani having originating from the hotel group of the same name and Paul Dubrule emerging from the Accor Hotel Group.

  In some cases, however, establishing a gold standard such as those described above may be counterproductive, creating what may appear to many schools to be an impossible bar to reach and thereby discouraging any attempts to do so. In such cases, encouraging piecemeal reforms in key areas and drawing on schools that model best practices in those specific areas may be a viable alternative. Some relevant examples were highlighted in this report. For example, in curriculum development, one university in Vietnam partners with Samsung, and in this context, Samsung developed a specific course for a select group of students, who can take the course as an elective. Two universities in Vietnam (one in tourism and one in electronics) borrowed curricula from foreign universities and adapted them for their use, enabling them to quickly bring their curriculum up to international standards. Most of the curricula that are being borrowed have been informed by private-sector input, and thus, they serve as proxies for the private sector's actual involvement in the curriculum-development process.

  Using industry workers as guest lecturers at universities and, conversely, professors to conduct seminars for industry, although not commonplace, is happening ad hoc, most notably in Thailand and Vietnam. Incentives are needed on both sides to further encourage this type of cross-fertilization. The implementation of foreign models would be invaluable. Lower Mekong universities can benefit from partnering arrangements with foreign universities with well-developed systems to engage academic staff in commercial assignments while encouraging private-sector lecturer involvement at the university level. Such partnerships may be *brokered* with EIs from areas in well-developed electronics clusters, e.g., Tech City (Cambridge, UK), Elcina (Rajasthan, India), and Silicon Valley (CA, US). There is no need to create such systems from the ground up. Experimentation is also taking place to encourage further faculty engagement with industry by, for

example, paying faculty their full salaries even when they are engaged for part of the year with industry, either as consultants or by simply spending time on-site in a learning capacity. *It is important to note that these best practice examples may not necessarily coincide with practices of the anchor universities COMET has identified.* Sometimes large research universities are bound by tradition, and trying to turn a large ship can be challenging. Some of the examples identified here are actually in use by newer schools, which are less bound to their past and more nimble and capable of innovating.

- Re-branding TVETs. TVETs suffer from an image problem among both students and their parents. However, for tourism in particular, TVETs are doing a better job overall at producing graduates with the requisite skills to succeed. One alternative is a re-branding campaign for TVET institutions, particularly in Thailand and Cambodia, where there is a clear preference among students for university-level educations. Because TVETs are an important feeder into industry, such an effort could be a collaboration between industry and TVET institutions, with the objective of raising awareness about TVET education, transmitting information about the earning power of graduates, and changing its image as a "second-rate" education.

- Raising STEM awareness among women. Greater gender inclusivity in the electronics sector would seem a natural area of collaboration between universities and the private sector, both of which should have a vested interest in a wider and more talented applicant pool. To promote the participation of women in the field, universities and TVETs could sponsor events at the lower levels of education, such as STEM days for girls to encourage them to study subjects such as physics and math and to reduce the social stigma associated with studying certain fields. It would be interesting if such an event were co-sponsored by a private sector association, such as the Thai Embedded Systems Association, that also has a vested interest in promoting increased numbers of skilled graduates. One foreign institution is meeting directly with girls from its feeder schools on the campus where it hosts contests/competitions and provides open access to its laboratories.

- Increased emphasis on soft skills development. Clearly, the soft skills and attitudes of recent graduates are generally seen as greater obstacles to satisfactory job performance than even the lack of hard industry skills, especially among line staff. EIs need to take this issue seriously and introduce more soft skill curricula required for degree completion. Such curricula should be developed with input from industry representatives who are best suited to either offer their own programs (especially in tourism, which is more generalized and broadly applicable than electronics) and/or initially teach the classes themselves. Many industry managers indicated a willingness to assist with short-term teaching at universities interested in adopting new courses for core curricula. Courses with modules on work-readiness, career planning, realistic expectations, and the importance of taking initiative would provide students with the types of soft skills that industry demands and should help EIs build their capacity. Such concepts should actually be introduced in secondary school and intensified during university, especially in the

final two years. As noted previously, *fun* and interactive activities, such as competitions, to facilitate people working together collaboratively are effective soft skills builders. Additionally, although this was not an area that we explored as part of our study, extracurricular activities and/or creative outlets (such as school clubs, professional societies, and art programs) can be important ways to strengthen soft skills, such as communication and leadership skills. If EIs were to position themselves as turning out well-balanced, work-ready students cognizant of the patience required to build a career, employers will line up to secure their graduates.

- Development of new curricula. Related to the seven touch points, EIs must be persuaded to change the manner in which new curricula are considered for adoption in two respects. First, curriculum development should more aggressively incorporate private-sector input. One alternative is the active involvement of private-sector actors on curriculum committees. In addition, university curricula need to be revised on a more-frequent basis than the five-year cycle stipulated by governments. Even with private-sector input, such infrequent curriculum reviews will make it nearly impossible to keep up with the latest industry developments. Otherwise, the so-called vicious circle continues wherein new curricula, which are unknown to students and therefore not yet demanded, will never be adopted, and the dysfunctional cycle will remain unbroken. Surely, the best way to persuade large academic institutions to alter their modus operandi in this respect involves leveraging resources for new curricula, engaging part-time industry lecturers, and in some cases, upgrading physical facilities to improve the practicality of the learning environment for students. Some in industry, such as those indicated in the case studies, have shown a willingness to assist.

- Development of CPE. Strong industry growth and the frequent premature promotion of staff (notably in electronics) have opened up an opportunity for EIs to add short-term (6- to 12-week) intensive CPE programs for industry. This is a seriously underutilized niche and is also a potentially excellent revenue earner. However, elevated skill levels among lecturers and up-to-date curricula are pre-conditions for industry to seriously consider adopting CPE programs.

- Incorporation of gender diversity training. Overall gender equity among tourism and electronics companies is stronger than that in many other sectors, with women actually being favored in some circumstances. Nonetheless, women at the managerial level are considerably less common, likely making up less than 40%. Universities have a role to play going forward in supporting change. Required curricula on the importance of gender diversity at all organizational levels and on its contribution to the strength of the private sector and the country as a whole are well advised. Strongly encouraging women to engage in both STEM and managerial curricula is also crucial.

- Tracer studies for graduates. Few EIs track their students after they graduate. Therefore, they lack information about where their graduates work, what they make, or how long it usually takes them to become employed. Developing tracer studies would provide

invaluable information that can inform curriculum development and placement strategies and contribute to building stronger alumni networks.

- Increased orientation toward building multidisciplinary skill sets. In both tourism and electronics, very specialized education has been detrimental to students. In electronics, for example, management candidates require a well-rounded combination of skills, including supervisory, technical, and language skills and strategic industry knowledge. Additionally, students studying software design should also be required or encouraged to study project management. In tourism, for sales and marketing professionals, skill sets should include industry marketing strategy, professional-level language skills in English/Mandarin/Russian, and sales and marketing skills. These must be treated by EIs not simply as individual course requirements but as intensive skills-engendering programs spanning multiple course levels (from beginning to advanced). The key here is to impart various skills sets customized according to the nature of the student's core curricula focus, e.g., management and operations or marketing and sales.

- Greater flexibility to take courses across multiple departments. In some cases, the ability to develop relevant skill sets is limited by school bureaucracies. Thus, it is difficult for engineering students to take relevant coursework in a related field, such as operations management; instead, engineering students are often forced into a stove-piped course of study, such as electrical engineering, mechanical engineering, or process engineering, which is not necessarily aligned with the future needs of industry. For example, automation stands at the intersection of all three of these fields. Thus, curricula should be designed to facilitate the ability of students to study subjects that relate to one another rather than adhering rigorously to a formulaic understanding of what constitutes a coherent course of study. The private sector is reinforcing the need for flexibility by seeking to hire multidisciplinary people with balanced skill sets. In tourism, the sometimes stated preference for business graduates over tourism/hospitality graduates is another indication of this trend.

- Incorporation of technology. In both electronics and tourism, students would benefit from the incorporation of some of the latest tools, technologies, and software. In electronics, at the university level, this may include the use of simulations, as in a few schools, though this technology is by no means being incorporated systematically. In tourism, curricula need to be more technology focused as well, in terms of both hardware and software acumen and use. Already, tour operators are complaining that graduates cannot handle a basic ticketing system. The inadequacy of existing curricula in this regard will be compounded as technological developments continue to accelerate.

3.1.1 Tourism-specific implications

- Focus on key sector needs. Despite the relative ambivalence among tourism employers about the need for tourism/hospitality degrees or vocational certificates for line staff, there is a clear preference for university degrees for front office and managerial employees, mainly to ensure at least some rudimentary tourism knowledge (and to

demonstrate that the recruits have the discipline required to complete a task). With this in mind, universities should be focusing on the skills sets most often described by industry as difficult to find, which would help expand the value of EIs to industry. These skills include the multidisciplinary skills needed by middle and upper-level managers:

– Supervision/motivation/management;

– Industry strategic analysis; and

– Basic financial and revenue analysis.

- Language training. As referenced in section 2.1, hospitality and tourism programs need to incorporate a broader spectrum of languages at a very high level, especially English, Mandarin, Russian and, to a lesser extent, French (especially in Vietnam), Spanish, and Italian. Proficiency is expected at a professional level in both spoken and written language to ensure not only face-to-face professionalism but also clear written confirmations and business correspondence.

- Current technology training. Graduates need to be well acquainted with the following:

– Third-party booking systems, such as Amadeus (commonly used in Southeast Asia);

– E-commerce;

– E-marketing platforms; and

– The role of mobile devices throughout the distribution scheme.

Universities, in particular, need to upgrade their curricula in these respects. The tourism industry lacks confidence in the usefulness of university graduates' knowledge vis-à-vis TVET graduates, who are typically imbued with more focused, practical training.

3.1.2 Electronics-specific implications

- Development of Common Facility Training Centers (CFTCs). Most institutions in Cambodia, Thailand, and Vietnam employ technology to only a rudimentary extent. In addition, in TVETs (principally the private TVETs in Vietnam), the equipment on which students are being trained is frequently out of date and requires companies to re-train students once they have graduated. This has significant implications, especially for students who need to be trained on relevant technologies in emerging industries in these countries (such as precision engineering). While USAID may not be able to offer financial assistance to support the widespread implementation of cutting-edge technologies, it might consider support for CFTCs. These could be located on the campus of a university or TVET or, if these locations would show too much favoritism, a separate site. Several schools could all be given access to the same facility to ensure that their graduates all have the opportunity to access cutting-edge technology. Alternatively, a CFTC could be set up on the premises of an industry association or technology park. Then, every company in the industry would have access to the facility and could use it for re-training. An additional contributing factor to the lack of resources limiting the use of

technology in the classroom is that many professors lack familiarity with relevant technologies (and, particularly relevant to engineering courses, simulations). This deficiency could be addressed through a TOT model akin to that currently being employed by COMET.

- Focus on relevant skills and applied knowledge.

    - Skilled technicians, not engineers, are most consistently in demand now because of the labor-intensive, low-value-added nature of the Southeast Asian electronics sector. In the short term, these activities include assembly, soldering, machine maintenance, and quality testing skills.

    - Engineers and technical workers are graduating having completed the usual course requirements, little of which involves applied knowledge. For future industry transformation, strengthened courses in applied statistics and probability, material/metallurgical properties, physics, chemistry, and other engineering-related sciences are needed. In addition, simulations can serve a useful function as a way of mimicking the applied knowledge students would otherwise receive in an efficient and cost-effective way.

    - Both now and in the future, a greater emphasis on integrated knowledge and team work will address many existing educational shortcomings. Robot competitions, similar to those held annually in Thailand, are effective means to imbue practical skills, both hard and soft.

- Leveraging industry assistance. Industry can be encouraged to expand their efforts with universities and TVETs to increase hands-on pre-graduate work and applied learning. One example, which is already occurring in some instances (see the Cambodian case study), involves upgrading lab facilities with the assistance of industry resources (including in the CFTCs mentioned previously).

- Upgrading training programs to world standards. Very few locally owned companies are involved in the electronics industry directly, and those that are simply produce the IP owned by others. With many low-labor-cost countries potentially waiting to emerge, the electronics industries in Cambodia, Vietnam, and Thailand (especially in the latter two) must differentiate themselves and upscale their operations to elevate their value-added to the next level. Several key growth trends are particularly encouraging for the further development of competence:

    - ODM: much greater design input;

    - Precision manufacturing: high tolerances for machines and micro components;

    - The IOT: software design for networked devices and sensors; and

    - Automation: the integration of electrical and mechanical engineering.

In light of these trends, for universities to remain relevant, they must bring electrical, mechanical, and software engineering programs much closer to world standards. If they do not, industry will continue training their own people, importing urgently needed skills, and forsaking higher-value-added processes. The implication for vocational training centers is similar to that for universities: remaining relevant means upgrading to enable high-level training in precision tool and die-making skills and the quality assurance mindset that goes with these processes.

3.2   Recommendations for COMET: Private sector

- Gender diversity campaigns. Although and, in fact, because gender diversity is not recognized as a problem, a societal comfort level exists that prevents a more aggressive approach to eliminating this disparity. A public awareness program would shed light on this issue, particularly among sectors, such as tourism, that mistakenly believe they have roughly achieved gender parity. Publicity campaigns targeted to employers designed to illuminate actual hiring statistics would generate awareness and set the process in motion.

- Channeling training funds into EI curricula. To further incentivize private-sector collaboration with EIs, a useful exercise would involve initiating a survey of existing private-sector training costs and identifying the portion that might be eliminated if recent graduates' skills in specific areas were improved. This would allow cost/benefit analyses for corporate budget decision makers and the possibility of freeing up funds to support curriculum development in collaboration with partner academic institutions. In other words, the objective is to channel funds away from industry re-training and, more efficiently, into upgraded EI curricula at less cost to industry overall and with capacity-building benefits for EIs.

- Strengthening associations and chambers. Although the linkages between the electronics industry and EIs are more prolific and widespread than they are within the tourism sector, they remain largely ad hoc in both industries and depend on the wills of motivated individuals. A program to strengthen the capacity of existing associations and chambers may be worthwhile in cases involving an operating history and a respected management group in place. Efforts would involve building capacity to offer demand-driven, revenue-generating, intensive training programs. A parallel objective would be to establish an institutional development model that supports an honest broker role for associations and thereby strengthens the linkages between industry and EIs. Private-sector associations without a successful operating history or influential management should not be considered for inclusion in such a program.

- Organizing the industry's voice. Similar to how advocacy capacity-building programs build private-sector communication skills, industry should be educated to speak with one voice to EIs when attempting to influence the adoption of new programs and curricula. Presently, industry messages are mixed and usually focus on the needs of individual

companies themselves. This further reinforces the need for stronger industry associations and chambers with a clear liaison mandate between industry and EIs and staff dedicated to carrying it out.

- <u>Education to improve internship quality</u>. The uneven quality of internships was noted by a number of EIs, many of which suggested that enterprises sometimes seem reticent to hand over even the most basic responsibilities to their interns. Internships are an invaluable learning tool for students, but because they are important ways for enterprises to identify potential talent cheaply, these companies should also be invested in the quality of internships. Whereas the more sophisticated enterprises already have a good grasp of this concept, wide variability in the quality of internships remains. An initiative to better educate businesses on some of the principles of making internships an effective, win-win tool could be undertaken to share good practices. These practices may include the value of ensuring that each intern has a supervisor, the delegation of relevant tasks, and the evaluation of interns during and at the conclusion of the experience.

- <u>Potential collaborations</u>. A tourism respondent (described in the mini-case study: Vietnamese tour operator) is interested in entering into a collaborative arrangement with EIs to systematically improve the quality of tour guide training in the country. This operator possesses the capacity, expertise, and interest to contribute resources toward meeting this goal. If interest exists on COMET's part, an introduction will be arranged. There is also the possibility of including Solimar International, a USAID contractor and tourism capacity-building implementer, as a participant in such an endeavor. They are currently involved in the region and may be interested in contributing to a capacity-building effort.

3.3 Summary recommendations with success factors and dependencies

#	Recommendations	Key Success Factors	Mutual Dependencies	Recommended Phasing
	Overarching Recommendations for Educational Institutions (EIs)			
1	**Model and disseminate good university and technical vocational education and training (TVET) practices by examples and study tours**	• Receptive EI administrations • Applicable best practice role models & examples		
2	**Rebrand TVETs to alleviate their "second-rate institution" status – pilot then evaluate**	• Ability to craft a believable message that resonates with youth and their families		
3	**Develop tracer studies to track graduates and assist in normalizing their use**	• Receptive EI administrations	Rec 1	
	Recommendations to Enhance Curricula and Work Readiness			
4	**Revise the curricula development process with increased private sector input and more frequent reviews**	• EI willingness to reach out to the private sector • Industry readiness to engage with singular voice • Receptive EI administrations	Recs 1, 9, 10, 11, 13, 14, 15, 16, 18, 19	
5	**Facilitate the incorporation of technology and classroom simulation in keeping with industry trends**	• Adequate funding streams • In-depth understanding of core trends • Receptive EI administrations	Recs 1, 4, 9, 10, 15, 16	
6	**Further emphasize soft skills development via interactive exercises and competitions**	• In-depth understanding of soft skills needs • Receptive EI administrations	Recs 1, 9, 10, 11, 15, 16, 19	
7	**Develop an orientation toward multidisciplinary skill sets, e.g., technical combined with managerial and marketing**	• In-depth understanding of logical multidisciplinary skills needs • Receptive EI administrations	Recs 4, 8, 9, 10, 13, 14, 15, 16	
8	**Improve flexibility and incentives that enable students to take courses across multiple departments**	• In-depth understanding of logical multidisciplinary skills needs • Receptive EI administrations	Recs 7, 9, 10, 18	
9	**Tourism specific curricula recommendations:** **a) Focus on key sector needs – supervision, strategic analysis, financial analysis** **b) Higher level language training – especially English, Mandarin, Russian** **c) Engage in current technology training – booking systems, e-commerce, e-marketing**	• Active use of systematic EI / industry fora • Receptive EI administrations	Recs 4, 5, 6, 7, 8, 12, 13, 14, 15, 16	
10	**Electronics specific curricula recommendations:** **a) Focus on applied engineering sciences – statistics, physics, metallurgy, and practical ways of learning, e.g., robotics competitions** **b) Upgrade to reflect world standards/trends – original design manufacturing (ODM), precision manufacturing, internet of things (IOT) and automation** **c) Increase teamwork for improved integrated knowledge and soft skills**	• Active use of systematic EI / industry fora • Receptive EI administrations	Recs 4, 5, 6, 7, 8, 12, 13, 14, 15, 16, 18	

#	Recommendations	Key Success Factors	Mutual Dependencies	Recommended Phasing
		Recommendations to Strengthen Overall EI and Private Sector Coordination		
11	**EIs seek industry buy-in to prioritize and develop continuing professional education (CPE) programs**	• Industry belief in CPE value (worth paying for) • Receptive EI administrations	Recs 1, 2, 5, 9, 10, 11, 12, 13, 14, 15, 16	
12	**Facilitate the development of common facility training centers (CFTCs) through multiple EI and industry stakeholder partnerships**	• Industry readiness to engage with EIs toward a perceived valuable outcome • Receptive EI administrations	Recs 1, 4, 5, 7, 9, 10, 13, 14, 15, 16, 18	
13	**Systematically leverage industry assistance through structured industry-EI liaison platforms that enable collaboration**	• Active use of systematic EI / industry fora • Receptive EI administrations • Industry readiness to engage with EIs toward a perceived valuable outcome • Strengthened industry associations	Recs 1, 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 15, 16, 17, 20	
14	**Survey industry training costs, which could be reduced if graduates were more skilled then seek to channel private sector funding into EI curricula**	• Industry readiness to engage with EIs toward a perceived valuable outcome • Involvement of industry associations with adequate capacity for surveying • Receptive EI administrations	Recs 4, 5, 6, 7, 8, 9, 10, 13, 15, 17, 18	
15	**Build capacity in private sector associations with capable management teams, include EI repre-sentatives then work to bridge EI / industry gap**	• Presence of industry associations with adequate capacity to build upon • Willingness of EIs to partake in association activities	Recs 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 20	
16	**Related to previous, help establish a singular industry voice to better articulate needs for graduates, both existing and foreseen**	• Presence of industry associations with adequate capacity to build upon • Industry willingness to engage with a cluster mentality	Recs 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 20	
17	**Inform and educate the private sector about internship best practices to improve the student learning experience (and their own)**	• Industry readiness to engage with EIs toward a perceived valuable outcome	Recs 1, 7, 9, 10, 13, 14, 15, 18	
		Recommendations Specific to Gender Diversity		
18	**Raise science, technology, engineering, and math (STEM) awareness among women through internal EI programs, particularly in electronics, to increase skilled female graduates**	• Ability to influence and measure acceptance at student and societal levels • Receptive EI administrations	Recs 7, 8, 9, 10, 14, 19, 20	
19	**Assist to incorporate university level course modules that underscore the need for and benefits of gender diversity**	• Availability of existing relevant modules • Receptive EI administrations	Recs 4, 8 , 18, 20	
20	**Develop a public awareness campaign targeted to employers in key industries to shed light on the need for increased gender diversity**	• Ability to craft a message that succinctly defines the benefits to industry and society	Recs 2, 3, 15, 17, 18, 19	

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ANNEX A: List of Interviewees

Below we provide the list of people interviewed during this study.

Private Sector		
TOURISM		
Cambodian Federation of Employers – Phnom Penh	Tep Sophoan, Membership Services Manager & Yoeurm Borann, Senior Admin and Finance Exec.	Phnom Penh
Cambodian Association of Travel Agents	Ang Kim Eang, President	Phnom Penh
Cambodian Restaurants Association (active in multiple others)	Carol Shaidak-Beaver, Executive Director	Phnom Penh
Cambodia Hotels Association	Somethearith Din, President (and hotel owner)	Phnom Penh
Tep Apsor Tours and Visas	Boeur Phirom, Director	Phnom Penh
Amansara Resort	Doung Spoheap, HR Manager	Siem Reap
Cambodia Federation of Employers – Siem Reap	Lay Chantheara, Membership Services	Siem Reap
Raffles Hotel	Chantra Eung, HR Director	Siem Reap
Le Meridien Hotel	Ty Sokunthea, HR Director	Siem Reap
Conrad Hotel	Herman Ehrlich, General Manager	Bangkok
Joint Chambers of Commerce / Rembrandt Hotel	Eric Hallin, Tourism Committee Chairman & Rembrandt Hotel General Manager	Bangkok
Le Meridien Hotel	Julie, HR Assistant Manager	Bangkok
Dusit Hotel	Mongkol Towat, Training and Quality Assurance Manager	Chiang Mai
Sofitel Saigon Plaza	Nguyen Thi Ngoc Lan, Director of Rooms	Ho Chi Minh City
Viet Holiday Tours	Mai Nam, Marketing Manager	Ho Chi Minh City
Buffalo Tours	Trang Kim Tuong, Regional Operations Manager	Ho Chi Minh City
ELECTRONICS		
Mitsu Corp (Automotive Diagnostic)	Sot Sim, Assistant Manager	Phnom Penh
International Business Chamber of Commerce	Yann Sophoan, President	Phnom Penh
Microsoft	Channak Chea, Business Development Manager	Phnom Penh
USAID Development Innovations Program	Kate Heuisler, CoP, Ten Vibol, DCoP	Phnom Penh
Schneider Electric Corp.	Kaing Taing, Country HR Manager	Phnom Penh
Arc Hub (3D printing tech)	Ki Chon Tran, Founder	Phnom Penh
EZE Com (internet provider)	Yeng Sok, Business Solutions Manager	Phnom Penh
Thailand Embedded Systems Association	Khun Apinet, Director (former)	Bangkok
National Electronics and Computer Tech Center	Dr. Suthee, Director	Bangkok Pathum Thani
Western Digital	Sampan Silapanad, General Manager (and former President of Electronics & Computers Employers Assoc.)	Bangkok Chatuchak
Hutchinson Technology	Abraham Steiman, Managing Director	Bangkok Chatuchak
Fujikara	Junju Fukhara, CEO (plus 3 other HR people)	Bangkok Chatuchak
Thailand Board of Investment	Ajarin Pattanapanchai, Deputy Secretary General	Bangkok Chatuchak
Data Logic	Tran Chien Phat, General Director	Ho Chi Minh City
Thermtrol	Cao Hung Son,	Ho Chi Minh City
Vietnam Chamber of Commerce and Industry	Nguyen Duc Binh, Director	Ho Chi Minh City

Educational Institutions		
TOURISM		
Chulalongkorn University	Dr. Punthuadee Katawandee, Head of Cultural Management/Cultural Tourism Development	Bangkok
Mahidol University	Dr. Roberto B. Gozzoli, Chair of Tourism and Hospitality Management Division	Bangkok
International Hotel and Tourism Industry Management School (I-TIM)	Dr. Sawat Udompoch, Advisor to the President	Bangkok
Dusit Thani College	Veera Pardpattanapanich, Rector	Bangkok
Prince of Songkla University	Dr. Tatiyaporn Jarumaneerat, Deputy Dean for Administration and Research	Phuket
Chiang Mai University	Dr. Saranphat Wongut, Dept. of Tourism, Faculty of Humanities	Chiang Mai
Hanoi University	Dr. Hoang Gia Thu, Dean, Faculty of Management and Tourism	Hanoi
Siem Reap University of Southeast Asia	Dr. Gnel Rattha, Dean of Faculty of Economics, Business, and Tourism	Siem Reap
Sala Bai		Siem Reap
Paul Dubrule	Helga Nagy, Director	Siem Reap
Build Bright University	Pen Chamrong, Vice Dean of Tourism and Hospitality	Siem Reap
Friends International	Tho Maneth, TSEE Project Manager	Siem Reap
Royal University of Phnom Penh	Dr. Neth Baromey, Head of Department of Tourism	Phnom Penh
National Polytechnic Institute of Cambodia	Mr. Sum Sochenda, Head of Department of Tourism and Hospitality	Phnom Penh
PSE - Pour un Sourire d'Enfant Phnom Penh Office	La Vibol, Director of PSE Institute	Phnom Penh
Norton University	Sivannat Oum, Vice-Dean	Phnom Penh
ELECTRONICS		
King Mongkut's Institute of Technology Ladkrabang	Dr. Yossiri Ariyakul, Assistant Dean for Relation Affairs; Dr. Somsak Choomshuay, Associate Profssor in Electronics Engineering; Dr. Surapan Ueaphaiboon, Head of Electronics Engineering Department	Bangkok
Asian Institute of Technology	Tripti Rajbhandari, Senior Program Officer for Promotino and Student Recruitment, School of Engineering and Technology	Bangkok
King Mongkut's University of Technology North Bangkok	Dr. Petch Jearanaisilawong, Associate Dean for Planning and Development and Dr. Nophadon Wiwatcharagoses, Assistant Professor and Chairperson of ECE Department	Bangkok
Science-Based Technology Vocational College	K. Premjit, Director	Bangkok
Chulalongkorn University	Dr. Boonchuay Supmonchai, Department of Electrical Engineering	Bangkok
Chiang Mai University	Dr. Sermsak Uatrongjit, Department of Electrical Engineering	Chiang Mai
University of Technology and Education	(Ms.) Ly Thien Trang, Deputy Head of Office of International Affairs (OIA), and Dr. Nguyen Minh Tam, Dean	Ho Chi Minh City
Hochiminh city University of Technology	Ms.) Nguyen Thi Nhan Program Coordinator External Relations Office, and Dr.-Ing. Tuan Do-Hong, Dean	Ho Chi Minh City

Hanoi Vocational College of High Technology	Tung Nguyen Trong, International Cooperation Specialist, and Tran Xuan Ngoc, Vice President	Hanoi
Hanoi vocational college of technology	Nguyen Ngoc Long, Collaborate Trade Manager, and Associate Professor Do Van Truong, Vice Rector	Hanoi
RMIT University	Tran Thi Thuy, Special Projects and Research Manager	Ho Chi Minh City
Hanoi University of Science and Technology	Dr. Vu Tuyet Trinh, Vice-Director of International Cooperation Department Office	Ho Chi Minh City
Hochiminh Vocational college of technology	Do Ngoc Minh, Dean, Faculty of Electrical-Electronics Engineering	Ho Chi Minh City
Don Bosco Technical School	Suy Chheng, Head Master	Phnom Penh
Norton University	Dr. Chan Mithona, Head of Electrical and Electronic Engineering Department	Phnom Penh
Institute of Technology of Cambodia	Dr. Bun Long, Head of Department of Electrical and Energy Engineering	Phnom Penh
National Polytechnic Institute of Cambodia	Mr. Chan Sopheap, Head of Electronics Faculty	Phnom Penh
Paññāsāstra University of Cambodia (PUC)	Dr. Pahlaj Moolio, Associate Dean, Faculty of Mathematics, Sciences, and Engineering	Phnom Penh
OTHER		
Institute of Tourism Personnel Training	K. Jang	Bangkok
International Labor Organization	Ngo Quang Vinh, National Project Officer and Nguyen Ngoc Dung, Project Assistant; Applying the G20 Training Approach, and Nguyen Thi Huyen, National Programme Coordinator, Sustainable and Responsible Tourism Project	Hanoi
USAID/Vietnam	Era Simon, Education Officer, Environment and Social Development Office and Nguyen Thi Hoa Le, Social Development Program Management Specialist, Environment and Social Development Office	Hanoi
Cambodia Development Resources Institute	Dr. Sothy Khieng, Research Fellow and Head, Education Unit	Phnom Penh

ANNEX B: Surveys

Below are the surveys used during the study.

Demand Side Questionnaire - Tourism

Introduction

Thank you for agreeing to provide us with your knowledge about workforce development issues. The survey should not require more than twenty minutes to complete.

The purpose of the survey is to thoroughly investigate the labor market in two sectors (tourism & electronics) across three countries in Southeast Asia (Cambodia, Thailand and Vietnam). The idea is to build upon workforce and labor research done by another program, USAID-funded COMET, but delve deeper into the mismatch between what educational institutions are delivering and what private companies need in terms of skilled employees. We will also try to identify trends, both on the supply side (educational institutions) and the demand side (private sector companies), which are most likely to impact the knowledge and skills needed by future graduates as they attempt to enter the workforce.

USAID's COMET program will use this information to develop new technical assistance activities, mainly with interventions directed toward educational institutions, to improve the efficiency and effectiveness of workforce skills development in Southeast Asia.

To thank you for agreeing to help us, we will provide you with a summary of the survey results. If you would like a summary sent to you, simply check the box at the end of the survey and provide your email address.

Please answer the following questions as accurately as you can. A best guess is acceptable if you are reasonably confident of its correctness.

Part 1 – Key demographics and baseline data

- Date
- Company name, location
- Interviewee name, position
- Company definition of full vs. part time employees
- Number of full time employees (percentage female)
- Number of part time employees (percentage female)
- Number of technical employees [*technical degree/technical training*] (percentage female)
- Number of managerial employees (percentage female)
- Expected percentage growth (or reduction) in full time employees one year from now
- Subsector categories engaged in:

    o Sun/Sand/Sport – Yes / No
    o Meetings, incentives, conferences, exhibitions (MICE) – Yes / No
    o Eco/Cultural/Adventure – Yes / No

Part 2 – Fundamental recruitment and employee relations policies

1) What are the most important activities you undertake when deciding to search for and hire a new <u>managerial</u> employee? (For each one below, rank their **current importance**, 1 to 5 with 1 being most important and 5 being least important; use each ranking only once)

                                                                             Rank

    a. Use of third parties such as recruiters   ____
    b. Advertising: online job boards, newspaper ads   ____
    c. Training institution career centers/placement programs   ____
    d. Personal networks   ____
    e. Other _____   ____

2) In which category was your average annual employee turnover rate for the previous three years? (Circle only one option below.)
    a. 0%
    b. 1% – 5%
    c. 6% –10%
    d. 11% – 20%
    e. 21% or more

3) Do you consider employee turnover a problem? If no, skip to Q6.
    a. Yes
    b. No

4) If yes to Q4, which of the following (if any) do you think would play a role in reducing employee turnover and in what ways? (Check all that apply and briefly describe)
    a. The company _____
    b. Educational institutions _____
    c. Employees _____

5) Does your company offer employee training? Y / N   If no, skip to Q8. If yes, please list the most common types/topics of employee training your company organizes:
    a. _____
    b. _____
    c. _____
    d. _____
    e. _____

6) How many days per year, on average, do each of your employees spend in company organized training? (Check only one box)
   a. None at this point but we plan to
   b. 1 – 3 days annually
   c. 4 – 6 days annually
   d. 7 – 10 days annually
   e. 11 or more days annually

Part 3 – Skills gap analysis

7) Please indicate urgent and near-term hiring needs:

Position	Urgent need – vacancy now (Yes / No)	Qty	Will need to hire within 2 years (Yes / No)	Est Qty
a. Reception or Front Desk				
b. Custodial or Housekeeping				
c. Tour Guide				
d. Travel Agent				
e. Chef or Food Service				
f. Skilled Office Worker				
g. Office / Site Manager				
h. Marketing / E-Marketing				
i. Sales / Business Development				
j. Customer Service Manager				
k. Other_____				

8) With respect to your hiring needs, which you have indicated in the previous question, please identify your preferences for education and experience levels:

Position	Education preferences – applicant has completed						Experience preferences – applicant time in related job				
	Don't care	HS	Voca-tional	Tech	Univ	Post univ	Don't care	Intern-ship	6 mos – 1 yr	1 yr – 3 yrs	More than 3 yrs
a. Reception or Front Desk											
b. Custodial or Housekeeping											
c. Tour Guide											
d. Travel Agent											
e. Chef or Food Service											
f. Skilled Office Worker											
g. Office / Site Manager											
h. Marketing / E-Marketing											

i. Sales / Business Development											
j. Customer Service Manager											
k. Other_____											

9) For these same positions and hiring intentions, please indicate your preferences about gender, if any:

Position	Gender Preference: Indicate only one of the following for each position: M (male), F (female) or N (no preference)
a. Reception or Front Desk	
b. Custodial or Housekeeping	
c. Tour Guide	
d. Travel Agent	
e. Chef or Food Service	
f. Skilled Office Worker	
g. Office / Site Manager	
h. Marketing / E-Marketing	
i. Sales / Business Development	
j. Customer Service Manager	
k. Other_____	

10) What kinds of qualified managers are most difficult to find? (Check up to three of the most important and note any specific preferences)
    a. Middle managerial _____
    b. Higher managerial _____
    c. Marketing & e-commerce_____
    d. Sales & business development _____
    e. Product or account management_____
    f. Other _____

11) What kinds of soft /interactive skills are most difficult to find in applicants/employees? (Check up to four of the most important and note any specific preferences)
    a. Languages

        _____

    b. Computer

        _____

    c. Communication

        _____

      d. Teamwork

_____

      e. Leadership / supervisory

_____

      f. Customer orientation

_____

      g. Problem solving / taking initiative

_____

      h. Basic work readiness (punctuality, hygiene, etc.)

_____

      i. Other

_____

12) Did you note any skills that are difficult to find in questions 11 or 12? Y / N   If no, skip to Q14. If yes, what would you say are the main reasons you have trouble finding people with the skills you need?

      a. _____

          _____

      b. _____

          _____

      c. _____

          _____

Part 4 – Employer perspectives on workforce development functionality

13) Below is a list of commonly used means to overcome skills gaps. <u>These can be handled in house by company staff/trainers or with outside contracted assistance.</u> (For each one below, rank their **current importance to your company** 1 to 5 with 1 being most important and 5 being least important; use each ranking only once)

                                                                                   <u>Ranking</u>

      a. On the job training   _____

      b. Short courses (in house)   _____

      c. Short courses or continuing professional education (off site)   _____

      d. Assisting employees to continue degree programs   _____

      e. Other _____ _____

14) Are linkages to any educational institution beneficial to your company?   If Yes, indicate which (if any) of the following <u>linkages with educational, technical or vocational institutions</u> you think would be beneficial to your company within the coming two years.

Educational institution program type	Used previously Y/N	If not used, main reason	Would benefit from and use within two years (and/or if the reason is corrected)? Y/N
a. Internships & workplace based learning			
b. Job fairs as an exhibitor			
c. Job fairs as a visitor			
d. Contacts with career centers for new applicants			
e. Use of university or other training institution faculty for in house training			
f. Use of training programs or continuing education programs at university or other training institution premises			
g. Other _____			
h. None of these are of interest			

15) In the past one year have you upgraded the skills of any employees in private sector training programs (industry run institutes, tech centers, industry training programs, etc.)? If yes, which topics, which providers and how do they compare with programs coming out of the education sector?

Program / Topic	Provider	How does it compare with what the educational sector is offering?
a.		
b.		
c.		
d.		

16) What barriers exist which prevent you from hiring more female employees? (Check all that apply.)
- a. Lack of qualified applicants

    b.   Geographic constraints related to transportation
    c.   Family constraints related to child care
    d.   Maternity leave
    e.   Labor laws that prove difficult to meet (please name)
       _____
    f.   Other, please explain:
       _____

Part 5 – Select trends influencing future skills needs

17) What industry and product/service trends do you foresee and how will they change your needs for skilled employees in the coming two years?

_____
_____
_____

Thank you for completing this survey. Please check the box and include your email address if you would like to be sent a summary of the survey results. 🔲   Email Address:_____

Demand Side Questionnaire – Electronics

Introduction

Thank you for agreeing to provide us with your knowledge about workforce development issues. The survey should not require more than twenty minutes to complete.

The purpose of the survey is to thoroughly investigate the labor market in two sectors (tourism & electronics) across three countries in Southeast Asia (Cambodia, Thailand and Vietnam). The idea is to build upon workforce and labor research done by another program, USAID-funded COMET, but delve deeper into the mismatch between what educational institutions are delivering and what private companies need in terms of skilled employees. We will also try to identify trends, both on the supply side (educational institutions) and the demand side (private sector companies), which are most likely to impact the knowledge and skills needed by future graduates as they attempt to enter the workforce.

USAID's COMET program will use this information to develop new technical assistance activities, mainly with interventions directed toward educational institutions, to improve the efficiency and effectiveness of workforce skills development in Southeast Asia.

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Part 1 – Key demographics and baseline data

- Date
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- Company definition of full vs. part time employees
- Number of full time employees (percentage female)
- Number of part time employees (percentage female)
- Number of technical employees [*technical degree/technical training*] (percentage female)
- Number of managerial employees (percentage female)
- Expected percentage growth (or reduction) in full time employees one year from now
- Subsector categories engaged in:
  - Data processing equipment – Yes / No
  - Parts and components – Yes / No
  - Consumer electronics – Yes / No

Part 2 – Fundamental recruitment and employee relations policies

18) What are the most important activities you undertake when deciding to search for and hire a new <u>managerial</u> employee? (For each one below, rank their **current importance**, 1 to 5 with 1 being most important and 5 being least important; use each ranking only once)

	Rank
a. Use of third parties such as recruiters	____
b. Advertising: online job boards, newspaper ads	____
c. Training institution career centers/placement programs	____
d. Personal networks	____
e. Other _____	____

19) In which category was your average annual employee turnover rate for the previous three years? (Check only one box)
   a. 0%
   b. 1% – 5%
   c. 6% –10%
   d. 11% – 20%
   e. 21% or more

20) Do you consider employee turnover a problem? If no, skip to Q6.
   a. Yes
   b. No

21) If yes to Q4, which of the following (if any) do you think would play a role in reducing employee turnover and in what ways? (Check all that apply and briefly describe)
   a. The company _____
   b. Educational institutions _____
   c. Employees _____

22) Does your company offer employee training? Y / N   If no, skip to Q8. If yes, please list the most common types/topics of employee training your company organizes:
   a. _____
   b. _____
   c. _____
   d. _____
   e. _____

23) How many days per year, on average, do each of your employees spend in company organized training? (Check only one box)
   a. None at this point but we plan to
   b. 1 – 3 days annually

  c. 4 – 6 days annually
  d. 7 – 10 days annually
  e. 11 or more days annually

Part 3 – Skills gap analysis

24) Please indicate urgent and near-term hiring needs:

Position	Urgent need – vacancy now (Yes / No)	Qty	Will need to hire within 2 years (Yes / No)	Est Qty
a. Electrical engineer				
b. Manufacturing process engineer				
c. Industrial designer				
d. Software architect / engineer				
e. Sales / business development specialist				
f. Marketing / e-commerce manager				
g. Quality assurance specialist				
h. Purchasing agent				
i. Product manager				
j. Merchandising specialist				
k. Other_____				

25) With respect to your hiring needs, which you have indicated in the previous question, please identify your preferences for education and experience levels:

Position	Education preferences – applicant has completed						Experience preferences – applicant time in related job				
	Don't care	HS	Voca-tional	Tech	Univ	Post univ	Don't care	Intern-ship	6 mos – 1 yr	1 yr – 3 yrs	More than 3 yrs
a. Electrical engineer											
b. Manufacturing process engineer											
c. Industrial designer											
d. Software architect / engineer											
e. Sales / business development specialist											
f. Marketing / e-commerce manager											
g. Quality assurance specialist											
h. Purchasing agent											

i. Product manager											
j. Merchandising specialist											
k. Other_____											

26) For these same positions and hiring intentions, please indicate your preferences about gender, if any:

Position	Gender Preference: Indicate only one of the following for each position: M (male), F (female) or N (no preference)
a. Electrical engineer	
b. Manufacturing process engineer	
c. Industrial designer	
d. Software architect / engineer	
e. Sales / business development specialist	
f. Marketing / e-commerce manager	
g. Quality assurance specialist	
h. Purchasing agent	
i. Product manager	
j. Merchandising specialist	
k. Other_____	

27) What kinds of qualified managers are most difficult to find? (Check up to three of the most important and note any specific preferences)
   a. Middle managerial _____
   b. Higher managerial _____
   c. Marketing & e-commerce_____
   d. Sales & business development _____
   e. Product or account management_____
   f. Other _____

28) What kinds of soft /interactive skills are most difficult to find in applicants/employees? (Check up to four of the most important and note any specific preferences)
   a. Languages _____
   b. Computer _____
   c. Communication _____
   d. Teamwork _____
   e. Leadership / supervisory _____

    f. Customer orientation _____

    g. Problem solving / taking initiative _____

    h. Basic work readiness (punctuality, hygiene, etc.) _____

    i. Other _____

29) Did you note any skills that are difficult to find in questions 11 or 12? Y / N   If no, skip to Q14. If yes, what would you say are the main reasons you have trouble finding people with the skills you need?

    a. _____
        _____

    b. _____
        _____

    c. _____
        _____

Part 4 – Employer perspectives on workforce development functionality

30) Below is a list of commonly used means to overcome skills gaps. <u>These can be handled in house by company staff/trainers or with outside contracted assistance.</u> (For each one below, rank their **current importance to your company** 1 to 5 with 1 being most important and 5 being least important; use each ranking only once)

                                                                   <u>Ranking</u>

    f. On the job training   _____

    g. Short courses (in house)   _____

    h. Short courses or continuing professional education (off site)   _____

    i. Assisting employees to continue degree programs   _____

    j. Other _____   _____

31) Are linkages to any educational institution beneficial to your company?   If Yes, indicate which (if any) of the following <u>linkages with educational, technical or vocational institutions</u> you think would be beneficial to your company within the coming two years.

Educational institution program type	Used previously Y/N	If not used, main reason	Would benefit from and use within two years (and/or if the reason is corrected)? Y/N
a. Internships & workplace based learning			
b. Job fairs as an exhibitor			
c. Job fairs as a visitor			
d. Contacts with career centers for new applicants			
e. Use of university or other training institution faculty for in house training			
f. Use of training programs or continuing education programs at university or other training institution premises			
g. Other _____			
h. None of these are of interest			

32) In the past one year, have you upgraded the skills of any employees in private sector training programs (industry run institutes, tech centers, industry training programs, etc.)? If yes, which topics, which providers and how do they compare with programs coming out of the education sector?

Program / Topic	Provider	How does it compare with what the educational sector is offering?
a.		
b.		
c.		
d.		

33) What barriers exist which prevent you from hiring more female employees? (Check all that apply)
   a. Lack of qualified applicants
   b. Geographic constraints related to transportation
   c. Family constraints related to child care
   d. Maternity leave
   e. Labor laws that prove difficult to meet (please name)
   _____
   f. Other, please explain:
   _____

Part 5 – Select trends influencing future skills needs

34) What industry and product/service trends do you foresee and how will they change your needs for skilled employees in the coming two years?
   _____
   _____
   _____

Thank you for completing this survey. Please check the box and include your email address if you would like to be sent a summary of the survey. ☐   Email Address:_____

Supply Side Survey

Demographic Information

1. Do you consider yourself a technical/vocational school or a university? University
2. What is the total student population of your school?
3. How many students are enrolled in the (tourism/electronics) course of study?
4. Of those students studying (tourism/electronics), what percentage are female?
5. Has enrollment in your school of (tourism/electronics-related fields) been increasing, decreasing, or constant over the last 3-5 years? If increasing or decreasing, by how much?
6. Does your student intake in (tourism/electronics) depend principally upon
      a) the capacity of your program
      b) the number of interested applicants
      c) the number of qualified applicants

Survey Questions

1. To what extent do you view your mission as equipping students with practical, employable skills? Please assign a number from 1-5 using the following scale.
      5-To the highest extent. Our sole mission is to equip students with practical, employable skills.
      4-To a large extent. Our primary mission is to equip students with practical, employable skills; but we try to provide a strong academic base as well.
      3-To a moderate extent. We aspire to provide an even balance of practical, employable skills and a strong academic base.
      2-To a limited extent. We aspire principally to provide a strong academic base, although we try to provide some basic, practical skills as well.
      1-To a low extent. Our sole mission is to impart our students with a strong academic base.

2. How would you describe the strength of the relationship between your placement office and private sector businesses?
      a) Very strong
      b) Somewhat strong
      c) Somewhat weak
      d) Very weak
      e) We do not have a placement office

3. Please indicate the services that your placement office provides (check all that apply).
      a) Job postings
      b) Workshops on CV development
      c) Workshops on interviewing skills and techniques
      d) Internship and/or apprenticeship arrangements
      e) Other (list)

4. Please describe the nature of private sector involvement in curriculum development at your institution.

5. Does your institution play a role in internships/apprenticeships? If yes, please describe the role of internships/apprenticeships in your program.
        a) Internships/apprenticeships are a required part of our curriculum.
        b) Internships/apprenticeships are not a required part of our curriculum, but we encourage students to pursue them and assist students in finding them.
        c) Internships/apprenticeships are not a required part of our curriculum; and although we encourage students to pursue them we do not provide specific support to them in doing so.
        d) Internships/apprenticeships are neither encouraged nor supported in our program.

6. What percentage of your graduates participate in an internship or apprenticeship prior to graduation?
        a) 0-10%
        b) 11%-20%
        c) 21%-30%
        d) 31%-40%
        e) 41%-50%
        f) > 50%

7. How do you obtain knowledge about private sector skill needs/requirements?

8. Please rank order the top skills requirements of private sector employers for your program's graduates.

Electronics:
        a) Electrical engineering
        b) Manufacturing process engineering
        c) Industrial Design
        d) Software engineering
        e) Other (specify)
Tourism:
        a) Culinary/Food Service
        b) Marketing/Sales
        c) Customer Service
        d) Management
        e) Tour guiding
        f) Other (specify)

9. Please name the top five employers hiring graduates of your program.

10. What kinds of activities would be of interest to you to develop over the course of the next three years in conjunction with the private sector (check all that apply)?

      a) Internships and workplace-based learning
      b) Job fairs
      c) Contacts with businesses to place graduates
      d) Use university resources (i.e. professors/teachers) to provide training to private sector on the business's premises
      e) Use university resources (i.e. professors/teachers) to provide training to private sector on the school's premises
      f) Other
      g) None of these are of interest

11. How well aligned do you feel your training is with the needs of the business community? Do you consider this a minor or a major issue?

      If the answer to question 11 is unfavorable;

12. Why do you believe this gap exists?

13. Please share with us some of your ideas for addressing the skill gap we just discussed.

14. What are some of the trends you have seen in educational technology and how do you envision them impacting either training delivery or placement of students?

15. How do you see changes in the educational landscape (for example short courses, MOOCs, adult continuing education, employer-sponsored training, work-based learning) impacting you?

16. How do you think more women could be encouraged to study (tourism/electronics)? What are the primary barriers to their doing so now?

17. Teachers with private sector experience?

18. Do you ever have guest lecturers in from PS?