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TRENDS/CASES

Vertically integrated skill development and vocational training for socioeconomically marginalised youth: The experience at Gram Tarang and Centurion University, India

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Abstract At present, India's education system turns out millions of young people who are ready to think, but not enough people with entrepreneurial or employment skills. As India faces increasing limits on its resources, both economic and natural, the competency and capability of human resources play a pivotal role in developing and sustaining the economy. The sector of skill development and vocational education requires a paradigm shift, from a static framework to one that is dynamic and constantly adapting to meet industry and social demands. Centurion University of Technology and Management has evolved to provide relevant and inclusive education to young people at every level, from school dropouts to graduates. Through its social entrepreneurship initiative, Gram Tarang Employability Training Services, Centurion partners with industries and the government to develop the capacity for employment and entrepreneurship in all its students and trainees. This article describes Centurion's vision, operational approach, and the underlying beliefs that guide its innovative thinking, based on its years of working in some of India's most marginalised and underdeveloped regions.

Keywords Skills development · Vertical integration · Recognition of prior learning · Integrated qualifications

I believe in the theory of the tabula rasa. That is, we humans are born without built-in mental content and our knowledge comes from our experiences, our social ecosystem, and our perceptions—factors we may or may not be able to control. It is also a fact that our individuality, inherent traits, and attitudes are influenced by our DNA. As a society we should aim to shape the experiences, opportunities, and social context that influence us so that all of us can fully develop our potential.

Currently, skill development and competency building is an important focus of policy debate across both developed and less developed countries. The relevance of traditional

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education is being challenged and virtually every country is experimenting with reforms. All stakeholders agree, in general, that education should focus on hands-on and experience-based learning, and practice-oriented delivery. But the design, development, and delivery of curricula have swung toward a focus on outputs and outcomes and on competency-based certification.

In India, people still see education as a way to earn a degree. Institutions are oriented toward producing graduates who are ready to think rather than being ready to work; the ideal for any growing country is to have people who are ready to both think and work. The education system must be dynamic and adaptable, and must evolve to combine theory, practice, outputs, and outcomes—but that is only possible through both vertical and horizontal integration. The scope of skills development and vocational education and training (VET) must be reoriented towards multi-skilling, reskilling, and upskilling. At Centurion University and Gram Tarang (CUGT), we have pioneered this approach, and are implementing it successfully.

Background

Over two centuries ago, Adam Smith (1776) noted the following:

> The man whose whole life is spent in performing a few simple operations, of which the effects are perhaps always the same, or very nearly the same, has no occasion to exert his understanding or to exercise his invention in finding out expedients for removing difficulties which never occur. He naturally loses, therefore, the habit of such exertion, and generally becomes as stupid and ignorant as it is possible for a human creature to become.

This means that if individuals are to remain innovative, imaginative, and creative, they must evolve by acquiring knowledge and experience. Every individual inherently desires to move up in life, rising through the organisational and socioeconomic ranks, and gaining more resources and privileges. This is what drives human beings to acquire additional skills.

Skills development is critical to increasing a society's overall productivity. It also empowers people, both socially and economically. And because people get those skills through VET institutes, VET is an important element of any country's education system.

The VET framework should consist of courses through which people gain hands-on knowledge, appropriate skills, and relevant experience that is directly linked to a career prospect. If VET is to play an effective role in the changing national context in India, and to let the country reap the benefits of a demographic dividend, some of its critical elements urgently need to be redefined and redesigned. Ideally, universities should partner with corporate actors to play major roles in making the VET sector flexible, contemporary, relevant, inclusive, adaptable, generally applicable, and innovative.

In the rest of this article, I analyse India's current VET situation, define the idea of skills, discuss vertical integration, describe the assessment that supports such integration, and finally offer CUGT as a case study of such integration.

Scenario analysis

In India, the formal VET sector follows the traditional, rigid, and carefully structured training programme lasting one to three years and culminating in a certificate, from either

the State Council for VET (SCVT) or the National Council for VET. SCVT diplomas are recognised by the state and central governments, and by employers in the private and public sectors. But the VET sector faces a host of problems: irrelevant curricula, inadequate mechanisms for delivery and assessment, and serious shortcomings in both quantity and quality. Unfortunately, neither industry nor the educational system seems willing to focus on the fact that the formal system fails to produce competent workers. People also fail to acquire competencies through the formal system of education.

India is unique in that most of its people have informal vocational training in various traditional arts, crafts, and trades. This training comes from knowledge passed down across generations, by association, through experience, by proximity to local trades, and by employment in the unorganised sector. People who learn in the non-formal VET sector have no access to recognition, quantification, validation, or accreditation of their competence, knowledge, and skills. As a result, many individuals who have acquired learning through informal or non-formal means remain excluded from the formal systems that recognise and accredit skills, work, and achievement. This leads to the illusion that the economy lacks, or is failing to utilise, its human talent and resources. This also reveals something about our values as a society.

Here is a paradox: today we worry both about unemployment and about the increasing, and hard to meet, demand for skilled labour in domestic industries. At present the textiles and clothing sector employs about 35 million people both formally and informally; by 2022 it is expected to employ more than 60 million. Similarly, the building and construction industry employs about 25 million people and is expected to demand nearly 60 million people by 2022. Similar patterns are seen for the auto sector, and for emerging sectors like organised retail (Hajela 2012). Projections in India's *Eleventh Five-year Plan* (GOI 2008) show that these sectors, which today employ the most informal labour, will grow the most over the next decade. The auto and auto component sector is projected to treble its demand for skilled manpower in that time, and the construction sector is projected to double it. Thus it is critical to understand the skill demands of these sectors and understand how best to train youth to meet these demands, and formalise their skills, and meanwhile enhance both their individual career development and the productivity of these and other sectors.

One major issue facing India is the increase in informal employment, which deters the growth of the existing VET training institutes. It also creates further disparity, making it harder to enforce labour laws and policies. And both skilled and semi-skilled workers face barriers as they try to enter the next level of qualifications or degrees. These barriers arise from a range of factors: mental, social, economic, academic, and policy-oriented. The majority of people working as welders, machine operators, drivers, and service technicians retire with almost the same designation they began with, since India has no structured pathway for entry into and exit from the formal education system. Besides, the perception that labour is not dignified discourages people from moving freely from industry to education and back again; this is especially true for the human resource pool at the bottom of the pyramid. This barrier could be largely eliminated if India would introduce and popularise the vertical integration of skills development through a robust system of accreditation and recognition of prior and experiential learning.

The Indian experience: The government context

A key lever in making lifelong learning a reality is the process of assessing, validating, recognising, and evaluating prior informal learning (AVREPL). India's VET sector has

virtually no system to recognise and certify the prior learning and experience of individuals who have worked in the unorganised sector for decades. Yet such a system would recognise, and validate, the hidden and unrecognised competencies that individuals have obtained through various means and in different phases of their lives. Valuing and recognising this learning could significantly improve individuals' self-esteem and wellbeing, motivate them to learn more, integrate broader sections of the population into an open and flexible education system, and strengthen their economic and livelihood opportunities.

India's government has initiated action on AVREPL with what it calls Recognition of Prior Learning (RPL), a part of the National Vocational Education Qualification Framework (NVEQF) issued in September of 2012. As Table 1 shows, the NVEQF supports people in attaining qualifications through various routes, including the RPL, the National Competence Certificate (NCC), and the National Certificate for Work Preparation (NCWP). The RPL mechanism will assess the competencies people have acquired through prior learning experiences and allow them to earn recognition through the NVEQF. Certifying bodies include universities, boards of technical education, and the Sector Skills Council (SSC).

India's dilemma

India is poised for double-digit growth, which will require approximately 13 million more workers every year. This is creating unprecedented competition for a talented and skilled workforce. About 12.8 million young people enter the job market every year but the current capacity of the VET system is only around 4.3 million places annually; 93% of the Indian workforce is employed in the unorganised sectors that largely remain outside the ambit of formal training. A vicious cycle has developed, based on an undersupply of skilled talent, mass underemployment and unemployment, a demographic deluge, and skewed policy initiatives. It is resulting in meager accomplishment despite the hype surrounding skills development and the VET sector.

Figure 1 shows the factors contributing to the shortages in the labour supply at every stage. Across the system, 16.6 million young people drop out every year; meanwhile 12.8 million need initial vocational training, but existing private and public institutions can only absorb and train 4.3 million of them. Thus the failure to integrate prior and experiential learning with formal education and VET results in an ironic combination: unemployment plus great skill shortages across industries.

Research on the factors that motivate students to drop out suggests that two connected factors—lack of interest in schooling and inability to do well there—account for more than 50% of school dropouts across both rural and urban parts of India (Jayachandran 2007). We may reasonably assume that these young people do not think of formal education as providing them a viable way forward, so they need an alternate approach, one more relevant to their context and motivations. Unless the country can capture the latent energy of these youth, using appropriate incentives, the much-hyped demographic dividend will revert to disaster.

Specific data from the state of Odisha paint an even grimmer picture. Using a range of official reports, I calculated that in the last 5 years (2009–2013), about 2,070,114 youth took the 10th standard examinations. Of them, 1,324,121 (about 65%) either failed or obtained only a 3rd division mark. Similar results are seen at the 12th standard level: 1,049,814 students took the exams in that period, but 747,355 students (about 71%) either failed or got only a 3rd division mark. This entire segment of children—the *majority* of

Table 1 Architecture of the NVEQF

Level	Certificate	Case I Equivalence	Case II Equivalence	Certifying body
10	NCC 8	Degree	Doctorate	University and SSC
9	NCC 7	PG diploma	Masters degree	University and SSC
8	NCC 6			University and SSC
7	NCC 5	Advanced diploma*	Bachelors degree**	Board of technical education, and SSC* University and SSC**
6	NCC 4			
5	NCC 3	Diploma*	Grade XII**	Board of technical education, and SSC* School Board and SSC**
4	NCC 2		Grade XI**	
3	NCC 1			
2	NCWP 2	Grade X	Grade X	School Board and SSC
1	NCWP 1	Grade IX	Grade IX	School Board and SSC
RPL	RPL 2	Grade VIII	Grade VIII	NIOS/SOS and SSC
	RPL 1	Grade V	Grade V	NIOS/SOS & SSC

Notes: SOS means state open school and SSC is the State Skills Council.

The asterisks (* and **) indicate the relevant certifying body for a given degree or diploma.

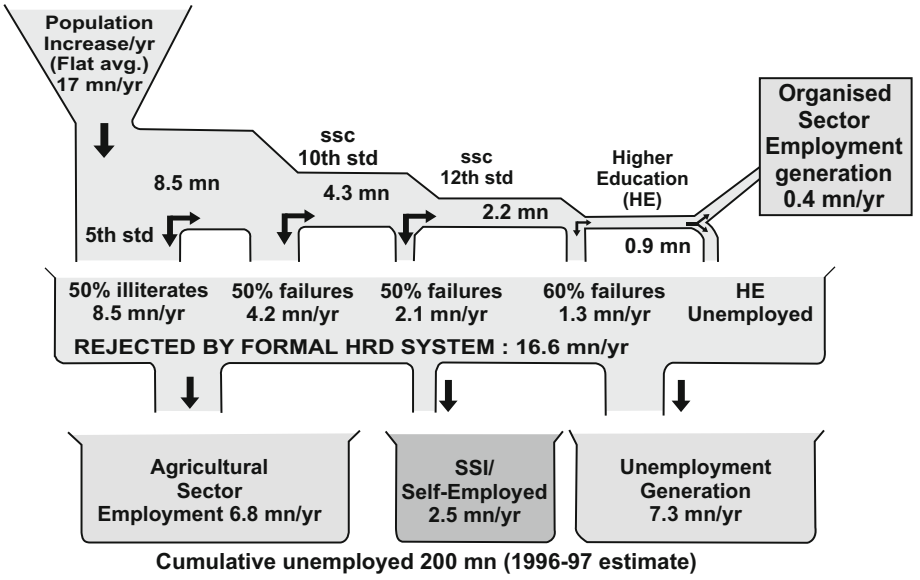

Fig. 1 Current scenario of demand and supply in India's labour market
Source: DEIS (2008–2009)

school-going youth in Odisha—have no career path through the formal education system, and need an alternative pathway. But the VET sector cannot absorb them all. Given this situation, India will have to implement a framework that validates and recognises the potential of individuals, and the skills they have learnt from a job, whether formal or informal.

In India, people do not value vocational education highly, especially in the blue-collar trades. Most young people in urban areas work in the unorganised informal sector; those in

rural areas seek seasonal employment. Others pursue higher education but later end up unemployed. Again, this highlights the inherent value of creating vertical and inclusive integrated pathways. Unfortunately, India lags far behind most other countries in the percentage of its youth who enroll in vocational education. In South Korea, for example, nearly 100% of youth are formally enrolled in the VET sector at either the second or third level of education; admission examinations for university-level programs include vocational education as a subject. The equivalent percentage in Japan is 80%, while in China it is lower but still almost 50%. Among the European nations, 40% of young Danes are enrolled, along with about 70% of young people in Germany and the United Kingdom. In comparison, the figure for India is 5%. Overall, then, India's current approach to training young people makes it almost impossible for a dropout to progress into a white-collar job, however skilled he or she may be. Thus I argue that AVRPEL represents the only way to integrate the less fortunate students into the mainstream.

Redefining skills

This brings us to the question of skills. I define skill as the "minimal resources resulting in optimal outputs and outcome". When people have skills, they waste less. Skills can facilitate inclusive growth by focusing on positive change: pro-poor policies, shared economies, equity and equality of opportunity, protection from the vagaries of market forces, and effective employment strategies, rather than income redistribution through subsidies and handouts. This is particularly important for India, where economic and social marginalisation is leading to radicalism and conflicts both within and between communities. The focus of Gram Tarang Employment and Training Services, which I lead, is to train and provide livelihood opportunities for people living in rural regions of Odisha and Andhra Pradesh, where left-wing extremist movements are creating significant political and economic instability. A video from the Gram Tarang Roshni project (2013) showcases a few of the people we work with.

Sustainable inclusive growth rests on inclusive education. Inclusive education is all about creating alternate ways and means of teaching and learning: multiple options for entry and exit, and a focus on hands-on, experiential learning, and on creating livelihoods. These are the essential aspects of skill development for individuals. The issue of skill development now presents a major challenge at every level of society, regardless of people's economic and social level. The demographic dividend that India so cherishes can turn into a demographic disaster if individual citizens do not have the sustained capacity and ability to add aggregate net value rather than simply acting as consumers.

Skills development, which encompasses upskilling and reskilling, has four aspects. The first is **economic**, and involves three elements. People co-create value, as every skilled person is an educator and creator of the next generation's talent pool. They optimise the use of resources, as skilled workers can add maximum value, and they develop a sustainable livelihood: skill creates alternatives to the curse of unemployment, technological unemployment, and disguised unemployment.

The second aspect is **technical**, and has two elements. Continuous improvement of capacity and confidence is vital today, when every sector of every country's economy is subject to continuous technological evolution. Appropriate skill development can allow individuals to continue to transform themselves, so they can cope with and adapt to this economic-technological revolution. Output optimisation is also vital. Technology is often defined as making, modifying, using, and knowing about tools, machines, techniques,

crafts, systems, and methods of organisation, in order to solve a problem, improve a preexisting solution to a problem, achieve a goal, handle an applied input/output relation, or perform a specific function at a given point in time. The technological revolution will achieve its desired results if appropriate skilled resources are available and can be put to appropriate use to optimise the nation's output.

The third is **social**, and has two elements. People must be self-reliant, independent, and self-sufficient. Rather than give a person a fish, which makes them dependent, we must provide them with equipment and teach them to fish—so they gain freedom through knowledge and confidence. They must also be vertically and horizontally mobile. Rather than leaving them to migrate in distress, targeted skill development allows people to experience purposeful mobility between jobs, between different geographic regions offering different types of opportunity, and between successively higher levels of jobs and opportunities.

The fourth is **political**, and again has two elements. When people have information, the result is better governance. Skills are the source of livelihoods, and skilled persons can move upward to at least the fourth level (esteem) in Maslow's (1943) hierarchy of needs. Moreover, skilled people can develop a community that is economically healthy and socially responsible. With their livelihoods established, they begin to demand knowledge and information; this becomes a habit, resulting in the desire for better governance as they exercise their rights and meet their responsibilities. When people do not have skills and have few ways to make a living, their society and lives are not productive and their mobility is restricted. Unable to fend for themselves, they demand handouts. This feeds into a vicious cycle of poor governance and poverty. These social challenges can cascade into further challenges.

Vertical integration in skills development

I now turn to my key idea: the vertical integration of skills development. Three elements are necessary to implement vertical integration. First, people must be able to enter and exit the formal VET system freely. Second, India needs AVREPL, as I described earlier. Third, industry and government must formulate policies to implement AVREPL and make it acceptable to the public. AVERPL is the most salient ingredient of vertical integration. It is a form of assessment that acknowledges skills, competencies, and knowledge gained through several sources: formal training, non-formal or informal training, work experience, and/or life experience.

Various institutions, organisations, and countries use very different terms and criteria for assessment and evaluation. A growing consensus holds that we must recognise informal, as well as formal, learning if we are to make learning accessible to all. As this area is constantly evolving, all parties—participants, facilitators in industry, and education providers—need to be aware of the local, and national, developments and policies. The debate on recognising prior and experiential learning is too complex to describe fully here, but I will describe the scenario in India and the experience of Centurion University.

Achieving vertical integration through AVREPL/ RPL

Vertical integration aims to recognise competencies people have acquired through formal or informal training and to allow upward progress in their education and career. It can lead to a wide range of outcomes, including the twelve below:

1. It smooths the access for non-traditional students—people who may not have as much opportunity and scope—to study further and attain higher qualifications.
2. It acknowledges learning outside a formal setting, and creates access or alternative admission to formal studies. That is, it values and recognises learning in the workplace.
3. It validates the learning that students have achieved on their own and in non-formal settings.
4. It facilitates their progression to other programmes of study, thus enhancing their possibility of learning other skills.
5. It eliminates the repetition and duplication of material that students already know, so training is less redundant and boring.
6. It reduces the time students need to earn a formal qualification, and thus motivates adults who might otherwise have to forego an income in order to study.
7. It allows participants to complete their formal education in less time and usually at lower cost.
8. It enhances individuals' pride and self-esteem when they see what they have accomplished as learners.
9. It bolsters their acceptance, perception, and understanding of learning as a lifelong process.
10. It levels out injustices by giving opportunity to those who did not have the opportunity for formal schooling.
11. It eliminates visible and invisible barriers to learning.
12. It recognises the diversity of knowledge.

As shown in Table 2, CUGT believes in a non-dogmatic, flexible pathway that allows people to move upwards as they acquire skills and formal degrees; we are trying to create a number of pathways that allow mobility between different degree systems, as well as between classroom education and work-based learning. To implement this system of constant upskilling and upward movement, CUGT not only conducts employment-linked practical skill training for youth; in addition it counsels young people, extensively and systematically, both before and after placement, to motivate them to enrol for the next level of formal certification even while they are working. As this process recognises the competency and knowledge that an individual acquires through work experience (on-the-job learning), it is called a work integrated degree. While CUGT was taking the initiative to experiment with this unique approach in India, the problem was that it was not widely accepted across India. Thus, the current reforms—the government's announcement of the National Skills Qualification Framework (NSQF) and the even more recent (March, 2014) guidelines for vocational education from the University Grants Commission—represent a timely intervention at the national level. These are important since the B. Voc. programme, to be introduced in universities under the NSQF, will accept and validate work-integrated degrees and offer a pathway to higher degrees as an alternate to traditional degrees.

As Fig. 2 shows, we have created a system that allows students to get formal certification along with their vocational certification. Thus they can graduate from grades 10 and 12 through the National Institute of Open Schooling (NIOS 2012), then earn a trade certificate with the National Council for Vocational Training (NCVT) and potentially also earn a diploma and advanced diploma, ultimately leading to a degree from the university. Thus we have mainstreamed the vocational certification so that it converges with traditional diplomas and degrees, making it possible for students to move up further once they

Table 2 Sample specifications for each level in the pilot programme at Centurion University for integrating vocational training into the formal education and accreditation system

Level	Specializations	Minimum duration	Competency to be achieved
Level 1	Industrial helper	01 year	i. Industrial safety: self, equipment and tools ii. Recognition of all types of hand tools, measurement tools and their use iii. Basic equipment operation: simple machines iv. Measurement and calculations v. Fundamental behavioural aspects to be maintained in the industrial or work environment
Level 2	Technician (Equipment operator)	02 years	i. Perfection in use of precision measuring instruments ii. Perfection in use of trade related machines iii. Ability to read the drawing and draw it with software like Auto CAD or CADian iv. Development of skill set mentioned in the syllabi v. Ability to work in shift system
Level 3 and Level 4	1. Supervisor 2. Expert technician 3. Process planner 4. Quality assurance 5. Maintenance and plant engineering	02 years	(i) Development of skill set mentioned in the syllabi of respective branch
Levels 5, 6, 7	Engineer	03 years	As per the guidelines of CUTM

reach a certain level of competency. Conversely, Gram Tarang allows students in the mainstream system at Centurion to gain hands-on knowledge and experience-based learning, through practice-oriented pedagogy.

Figure 3 compares this alternative system to the traditional and more linear system of education and certification. The traditional system occupies most of the figure, and our alternate educational path, through the CVEQF, is the block at right. Note that, in general, the CVEQF corroborates the NVEQF. Our approach at CUGT has been validated at the national level: in December 2013, the Government of India brought out the NSQF, whose approach entirely corroborates the pathway I have described here.

Credit distribution in our system

At Centurion University we are institutionalising the credit structure shown in Fig. 2. Our aim is to deliver instruction and assess training over consecutive levels.

- At Level 1 (1 year or 2 semesters), students earn 15 class credits + 35 practice credits (50 total), delivered in the standard mode, or through technological training on the job.
- At Level 2 (2 years or 4 semesters), students earn 18 class credits per year + 32 practice credits per year (a total of 100 credits over 2 years), with on-the-job training as in Level 1.
- At Levels 3 and 4 (2 years or 4 semesters), they earn 20 class credits per year + 30 practice credits per year (a total of 100 credits over 2 years), with on-the-job training as in levels 1 and 2.

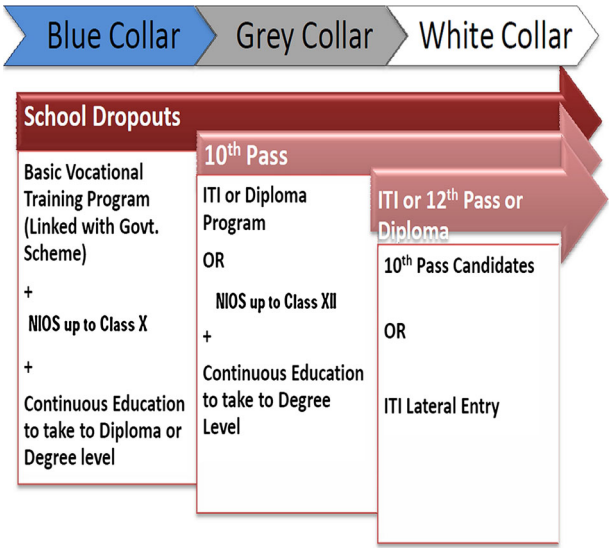

Fig. 2 Credit-based training, testing, and certification system for vertical movement

- At Level 5 and upwards (3 years or 6 semesters), they are merged with the business and technology programme, earning a Bachelors in Technology (B.Tech.) degree, where instruction is delivered in the standard higher education mode. Note that as they enter Level 5, they undergo an evidence-based competency assessment to determine if they can be exempted from some units needed for the degree. The timeline for the degree is 3 years or less.

We are using a variety of methods to assess the candidate's competency, based on several underlying principles:

- **Appropriate.** We use a basket of assessment methods to ensure that the assessment is in tune with the performance being evaluated.
- **Fair**. Assessment methods cannot disadvantage individuals or groups by limiting them in ways unrelated to the desired performance.
- **Continuous.** Candidates learn continuously, so the assessment should be continuous.
- **Manageable.** The methods are straightforward, readily arranged, and compatible with work or learning processes.
- **Systematic.** Planning and recording is rigorous to ensure that the access is adequate and fair.
- **Open.** Applicants thoroughly understand the assessment process and the criteria to be applied, and can contribute to the planning and accumulation of evidence.
- **Consistent.** When similar circumstances arise, the assessor replicates the judgment made in previous instances and assures that it is similar to judgments that other assessors would make.

Using evidence in assessment

Evidence is anything that supports an applicant's claim that he/she is competent on a recognised learning outcome or performance. It is information an assessor can use to make a judgment of

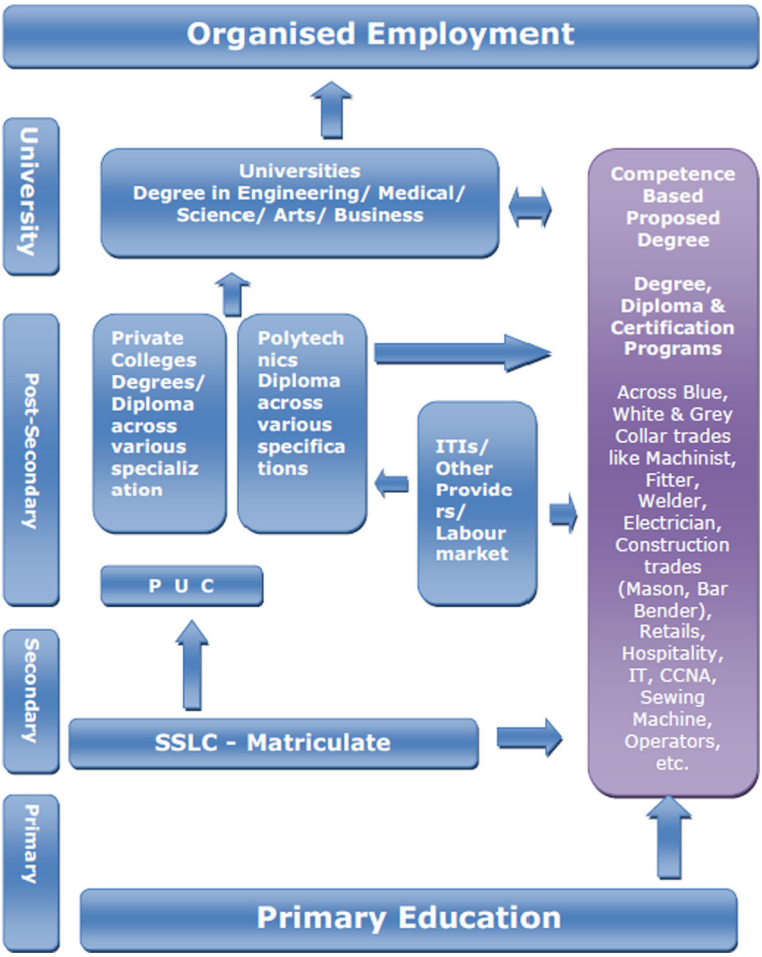

Fig. 3 Comparison of traditional and alternate educational pathways

competency. Most assessments use evidence gathered from more than one source, and in more than one situation; they can take many forms. Direct evidence is visual observation of performance. Indirect evidence can include evaluations of products or services, simulations or skills tests, performance appraisal reports, questioning, or reports from others.

Evidence should have four basic qualities:

- **Authentic.** The assessor is confident that the work being evaluated was completed by the person being assessed. No outside assistance or intervention can obscure the assessment.
- **Valid.** The assessment must be relevant and focus on the requirements defined in the competencies.
- **Sufficient.** The evidence will be of good enough quality to establish with confidence that all criteria have been met.
- **Scalable.** The student's performance should conform to the required standard in a way that can be replicated or measured consistently.

Table 3 shows the categories of evidence provided by NIOS (2012). Candidates may have to provide several types of evidence for each unit of competency to satisfy the assessor. In some cases they may offer evidence that meets more than one performance criterion.

Implementing the programme

The process of implementing a large-scale placement-linked programme requires extensive groundwork. In our case, it involved the ten phases shown in Fig. 4.

The CUGT approach to training

We aim to provide thorough technical training that will develop both our students' cognitive and practical abilities, and their social and behavioral traits, so they will be ready to work in specific industry fields. Therefore we focus on six specific goals.

- We want our students to learn through **experience**, using **practical hands-on** training.
- We **customise** our training certifications to the region, the industry, and the candidate.
- We **leverage our contacts** in existing networks to help us with scalability and sourcing, to ensure competent training staff, and to reduce costs.
- We stress **strong links with industry** for our employment-linked training programmes, and a wide range of **partnerships** with various other stakeholders.
- We partner with the government to sponsor young people who are members of **tribes or scheduled castes**, or of families who live below the poverty line.
- **We are registered** as a skill and knowledge provider with such regulators as the All-India Council for Technical Education and the Central Board of Secondary Education; we are a vocational training provider for the DGET (Directorate General of Employment and Training) and NCVT, since the Sector Skills Councils (SSCs) are still in a formative stage.

Our training programmes will be certified either by government agencies (NCVT, Ministry of Labour and Employment, State Council of Vocational Education) or by Centurion's Quality Assurance Cell, in partnership with SSCs. We are finalising our relationships with the SSCs, and will sign a memorandum of understanding by August of 2014. The NSDC (National Skill Development Corporation) is acting as the catalyst to formalise the agreement.

We offer high-quality pedagogy by recreating a live production environment and ensuring that trainees spend maximum time in workshops practicing their trade. We use a modular approach, focusing on four types of skills:

- **Technical (core + foundation) skills** are trade-specific and include a final module of on-the-job training within the industry the training is targeting.
- **Soft skills** include communications, presentation, self-management, work ethic, and team work.
- **Life skills** include financial planning for self and family, stress management through yoga and meditation, AIDS awareness, and hygiene.
- **Risk-bearing skills** help people with entrepreneurial potential to work towards self-employment as nano-, mini-, micro- and small entrepreneurs. We also promote group entrepreneurship, and have established a micro business centre to support and nurture young people and help them navigate toward self-employment after their training.

Table 3 Categories of evidence

Sl No	Categories of evidence	Examples
1.	Direct demonstration/ observation	Performance of an assignment, or range of assignments, either in the workplace or in a simulated work environment, witnessed and observed directly by an assessor
2.	Indirect demonstration	Use of photographs, videos, performance records, etc. showing performance of a task when the assessor cannot be present
3.	Review of products	Models, items, objects that have been made, upgraded or repaired by the candidate
4.	Workplace documents	Written communication, rosters, budgets, reports, standard operating procedure, log books, etc. developed by the candidate
5.	Written and oral questions	Asking the candidate about real, imaginary, or hypothetical situations to check understanding, and task and contingency management skills. These may be short answers, discussions, or multiple-choice or other responses to the scenarios, indicating knowledge of processes and procedures
6.	Assignments	Write-ups, case analyses, projects, reports, essays, etc.
7.	Third-party reports	Documented and verified reports from supervisors, colleagues, subject experts, trainers, or other evaluators, or performance reviews, in-depth investigations, or interviews with employers, supervisors, and/or peers
8.	Self-assessment	A candidate's personal statement on his performance (not generally sufficient in isolation)
9.	Simulation	Simulated activity to accommodate areas whose criteria are difficult to demonstrate, e.g. emergencies, contingencies, difficult behaviors, challenges, abrupt changes, safety challenges
10.	Portfolios	Collections of evidence compiled by the candidate: product with supporting documents, historical evidence, journals, log books, information about life experiences, etc.

Source: Adapted from NIOS (2012)

Our training is fully **residential**; we strongly believe that is the only way to successfully deliver short- and long-term skills development and vocational training in module-based programmes. Courses in VET and skills development mostly attract students from economically and socially challenged communities—who often have to earn an income to support their family. When they register in non-residential programmes, they must often miss class to work. The result is high dropout levels and poor learning when they do attend. On the other hand, residential programmes help them stay focused on their training for the period of the programme. And we offer them two options that help them continue. First, they can switch to a different trade during the training period. Second, we have introduced models that allow them to "earn while you learn" and to "learn while you earn", so they need not stop supporting their families while they train.

Further, since most of the employment opportunities available after training require them to move from the village to an industrial centre, we see their residential training programme as the first step in helping them adjust to living in a new environment. Moreover, many of the life skills in our programmes—like teamwork, sports, yoga, and keeping dormitories and bathrooms clean—cannot be imparted outside of a residential environment.

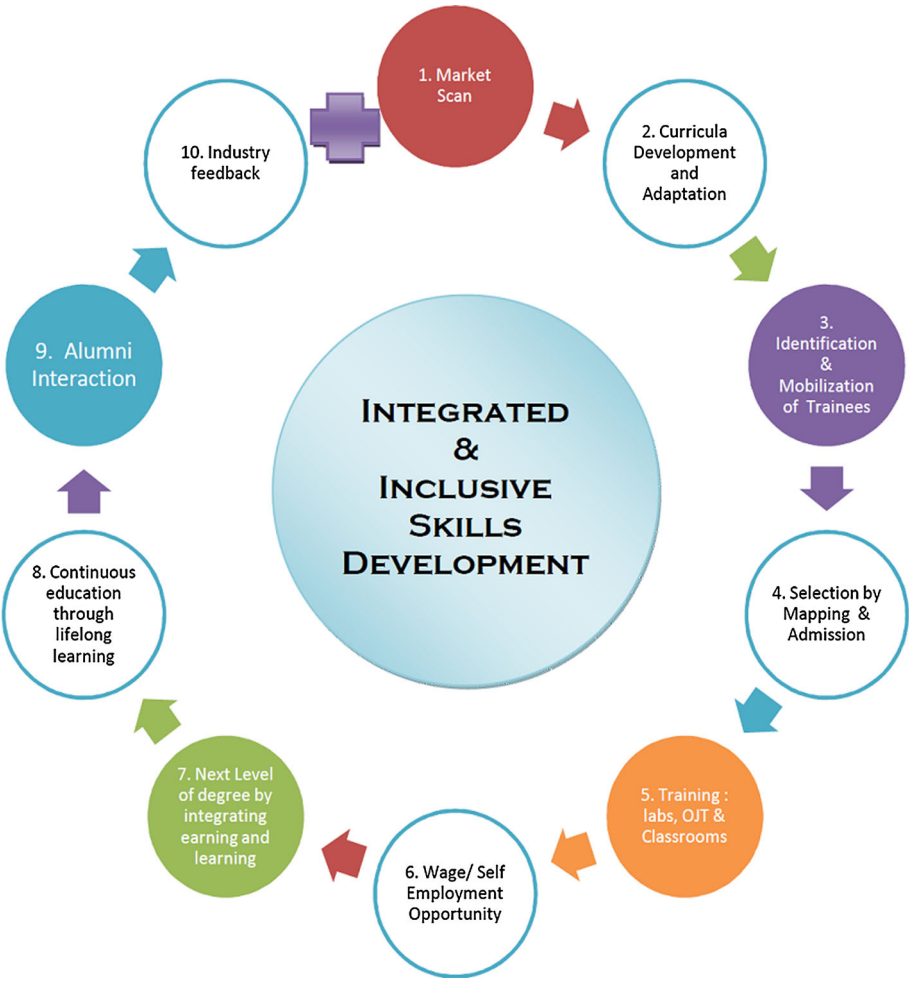

Fig. 4 The 10-phase rollout process

Inherent challenges in our approach

In India, the skills development sector, especially the VET sector, is subject to irrational exuberance. For over 60 years Indian policy makers ignored key elements of education, including competence, skills, and a focus on outcomes. During the past four to five years, however, politicians and bureaucrats have flooded us with new policies and commitments to skills development and VET—and with enthusiastic stories about the potential for skills development to succeed on a mass scale. But have we seen solid success? I believe this exuberance leads to a wide range of misperceptions, including hallucinations about potential outcomes and illusions about numbers and potential incomes. Given the specific policy view that the government appears to have taken, I believe that critical challenges lie ahead.

The **skills sector has become heavily corporatised**. Corporate heavyweights are entering the sector because the government has set an astronomically high target for the

number of people to train by 2020—500 million—and it intends to offer incentives to achieve this target. Not surprisingly, neither industry nor the corporate training entities is approaching this task from a social perspective. The potential trainees are mostly from poor and marginalised sections of society; they lack skills, have little employment experience, and have not had access to the formal education and training system. But the administrators appointed by the skills sector are people with no personal experience of poverty or of difficult and remote areas. Nor is industry offering empathy to these people or committing serious amounts of time to their training. And the multilateral and bilateral agencies have not contributed as expected. UN agencies, the World Bank, ADB, DFID, the European Union, and USAID, among others, have expressed their explicit intent to play important roles in the VET sector but little meaningful action has been seen so far. As a result, no powerful agents are addressing the current patterns of educational and economic inequality. This leaves the sector open to being shaped and dominated by the corporate training groups.

Another major challenge is the combination of **inadequate schooling and unfamiliar language of instruction** at the early primary level. Young people whose families are socially, economically, and linguistically marginalised can experience enormous fear in school, and resistance to learning; this is especially true for those from remote areas. It is easy for them to lose interest as they wait and wait for their schooling to pay off in any way. If we are to interest them in education, and retain that interest, we need an approach to training that engages them actively in an environment that is inclusive and structured. Our programme is specifically oriented to be inclusive, structured, and active.

Addressing concerns and challenges

At CUGT we are striving to address all these challenges and have taken some initial steps toward doing so, but we acknowledge that we too are continuously learning. Our approach is innovative, integrated, and involves multiple sectors and multiple dimensions, as I have stressed throughout this article. Below I list a few key aspects of this approach.

Social integration

Our most important social milestone is integrating young people who have dropped out of school with others who have earned diplomas. They live in the same residence, eat the same food, and use the same machines, labs, and workshops. And they play and celebrate together. This seamless social assimilation has created an atmosphere that builds confidence and sensitivity among the entire cohort. As a result, virtually no one drops out during training.

Local/community involvement

Gram Tarang was established to work with and for the community, especially members of socioeconomically and geographically marginalised social groups, to link them to the socioeconomic and political mainstream. We use direct linkages at the village level, and constantly create more, through our district-level managers, mobilisers, elected representatives, and village workers who are government employees. We also accept help from the local paramilitary forces such as the Central Reserve Police Force units operating in the tribal areas. And we use media in the local dialects to recruit students.

Integration with industry

We are involved with industry in many ways. We work with various companies to design, develop, and deliver courses, and they often partner with us to certify competencies. In addition they often provide funding and facility support and sponsor individual students. Among our many partners are the Rural Electrification Corporation, Hindustan Petroleum Corporation, Steel Authority of India, Godrej, Ashok Leyland, Café Coffee Day, Vedanta, Jindal, and Lanco.

Focus on learning through commercial production

We are entirely focused on hands-on knowledge and experiential learning. Students learn in environments that combine learning lab and workshop—so they are as close as possible to actual industrial production. For example, we use the same training machines and equipment that are used for industrial production—no prototype machines. Our learning labs-cum-workshops are ISO certified and registered as small-scale industries with the appropriate local and national government authorities; this allows us to actively engage in commercial production. And we work closely with several companies that manufacture high-end components, as well as furniture for educational institutes. Among them are Hindustan Aeronautics, RSB Transmission, NALCO, and Uni Parts. We are even integrating some English language skills into the workshop training, to further prepare students for jobs in the global economy.

Combined focus on teaching, training, and production

This combined focus allows us to meet many goals. The integration lets us establish the credibility of curricula and course delivery. Meanwhile it builds the confidence and capacity of instructors, and engages learners, sustaining their interest. Because they are interested, they finish the programmes and are ready to work. In an atmosphere of high-end equipment and skilled trainers, the machines are put to the best use possible, and the students absorb the entrepreneurial ambience.

Thus our approach is integrated in many ways, as we bring together people from various levels of society, offer them courses at various levels, and let them move upward through multiple opportunities throughout industry. We start at the village level, recruiting students through local-language media: low-skilled trainees can then share facilities with university-level students. We offer them multiple integrated curricula, drawing from VET, skills training, and university-level courses, providing a multitude of ways they can move upward. Even our classrooms are a combination of learning labs and workshops, so students get theoretical knowledge and practical experience at the same time. And we work with multiple stakeholders in industry to hire our graduates, raise funds, find faculty, and develop competencies.

Looking to the future

In our work we must remember a key point: the skills development and VET sector is dynamic and constantly evolving—and it always has been. If work in the sector were appropriately planned and thoughtfully executed, it could sustain itself and perennially add value to the Indian economy and society. The fundamental impulse that sets the VET

sector engine in motion and keeps it going is the expectation of consumers that they will have door-step goods and services with an ever shorter life cycle, and new processes of production (Just in Time, Lean/Flexible Manufacturing Technology). Now these are joined by the recent birth of RFID technology in logistics and supply chain management, the new markets consortium, and the new forms of footloose industrial organisations that capitalist enterprise creates. This is all occurring in a context where policy makers are not interested in making the education system more relevant, broad based, appropriate, and sensitive to learner needs.

We at CUGT believe we have crafted the way forward, at several levels. First, at the micro level, we have defined a robust path for disseminating information and building networks to recruit students. At this level, we intend to consolidate our position as skills trainers in Odisha and Andhra Pradesh in terms of both quality and quantity. Our target, by 2022, is to skill and train 25% of the students in Odisha who fail the 10th and 12th grades (a total of 100,000) so they can secure gainful employment or opt for meaningful self-employment. One way we are doing this is building an alumni network so that graduates can share information with potential trainees about the positive impact of skills development and VET.

At the meso level, we are expanding to neighboring states with similar political economies, including Jharkhand, West Bengal, and Assam. To make an impact at this level we must adopt new programmes and adapt to local contexts so we can provide innovative delivery models and training content, and retain our core strengths. For example, we are very interested in replicating our positive experiences with Ashok Leyland and Café Coffee Day in other parts of the country, but we are very aware that doing so may require a different approach.

At the macro level, CUGT is trying to initiate neighborhood community intervention centres (also known as micro business centres) in major urban slums where we can train students and build their capacity for self-employment and wage employment. We are currently involved in the first pilot project in India, working with a cluster of 2,000 families in a local slum dwelling community, Kargil Basti, using seed funding from the national and state governments. This initiative aims to alleviate the increasing levels of urban poverty through skills development and VET. In planning the next phase of impact at the macro level, we are in dialogue with various companies where our trainees are employed to conduct classes that let them graduate to the next level. Thus we are creating a path for vertical mobility in both education and employment.

Lessons learnt and yet to be learnt

CUGT launched its skills development programme in 2006 as part of its effort at community social responsibility. It intentionally began in Gajapati district, a hotbed of political extremism and an area with a gross enrollment ratio (GER) of 6%, far below the national average. Thus our goal in creating our skills development programmes was to develop the community within which we are embedded. Within our first seven years of operation, with our combination of university and training centres we have created significant change, from training and placing 64 candidates our first year to training and placing almost 15,000 young people during this current year. This rapid progress has also allowed us to quickly gain some very valuable insights about this undertaking, which I outline below.

Recruitment

Recruiting students through formal routes does not appear to be effective for the VET sector, especially when formal certification is not the goal. Instead of traditional recruitment, we have established local networks within villages and even urban slums to enroll students.

Life skills training

We have realised that students coming into our skill development programmes should not be expected to have the same behaviors and worldviews as those coming into our formal degree programmes—these two categories of students are qualitatively different. To provide the skills these students need we have developed various interventions we offer before, during, and after training. For example, we seriously focus on hygiene, sanitation, and routine discipline. To help them adjust to the culture of the workplace, we assign a mentor to each group as it moves from training into job placement. The mentor plays the role of life coach for about four to six weeks during the initial phase of the placement.

On-the-ground operations

Nearly a decade has passed since Centurion pioneered its work in skill development. Over this time, we have learnt how to recruit, coach, and retain trainees based on constant feedback. As a result, we now see that it is crucial to include relevant counseling material, and training modules offered in the vernacular, and we have incorporated them into our model. Also, as described above, we offer handholding support after training and during the initial period of placement.

Negotiating with employers

We have learnt to negotiate with the companies that will employ our trainees, to ensure their safety, job security and earnings, and to prevent them from reneging on contractual terms and conditions. In comparison to other NSDC partners, we have succeeded in getting better working conditions and benefits for our trainees. We believe this is essential if we are to set industry standards for employee welfare.

We negotiate for several kinds of benefits when we place our trainees. The first is monthly take-home: salary and bonuses in addition to routine living costs such as food, accommodation, transport, and other statutory deductions. We also ensure they get a regular amount for overtime, along with health care coverage, and casual, sick, and earned leave. And we ensure they have quality accommodation, including bed space, ventilation, and sanitation facilities.

Moreover, we ensure they have opportunities for the future. Can they progress and be promoted in the workplace beyond the immediate job? Can they access further skill development programmes, so they can continue learning? And finally, can they engage in lifelong learning and mainstreaming learning toward a formal degree? This is a goal we plan to facilitate.

Navigating government partnerships

We have learnt enormous amounts about managing government partnerships and proposals, and about government policies related to education and skill development. Thus we

can now identify the potential for public-sector partnerships, submit proposals according to complex protocols, negotiate with various departments and ministries to secure training projects, standardise and customise training delivery according to standards and guidelines from both government and industry, and use third-party audits and other evaluation mechanisms to ensure high credibility among our government stakeholders. Because of the vast experience we have gathered along the way, we are also in a position to advise our partners in both government and industry about matters related to skill development and education overall.

Scaling up

Our student numbers have risen from the double digits to the five-digit range. We have achieved this in just six years—and in that time have expanded from one campus to ten. Since we focus on core technical skills, scaling up is difficult, so we depend strongly on our collaborations and partnerships. Our model is "resource light"; that is, we negotiate with various firms to provide physical infrastructure. We also partner with institutes offering engineering degrees that are not attracting enough students, and we implement our skill development programmes in partnership with them, thus adding to their curricula. We first strengthened and finalised a core curriculum for skills development and VET in 30 trades up to level 6, and then built the capacity to deliver this training anywhere in India, using our infrastructure and experience to ensure delivery.

Sustainability

The main challenge in sustaining these institutions and programmes is the lack of teachers and instructors, and the complexity involved in attaining nationally accepted certification. We are currently creating a cadre of skilled teachers from our engineering students; they will teach not only at our Odisha and Andhra Pradesh campuses but also in factories where our trainees are employed, and at sites where we are offering skill development programmes for continuous learning. Further, to ensure that our certification is acceptable at the national level we are partnering with SSCs. We have proposed to the national government that we be accorded a unique status that we call skill-cum-workman university. This would allow us not only to offer skills training but also to accredit, validate, and recognise prior and experiential learning. This would make us a pilot institution in the nation, and allow us to contribute to developing the higher education and skills sector via our innovations and experience.

Juxtaposing learning and doing

Each year we have been in operation, we have tried to understand the employment market and also the education sector, and match the innovations in our learning model to both of them. We have mainly worked to create a model where students can move seamlessly between the phases of teaching, training, and production. All our labs and workshops are registered as small to medium enterprises with the Export Promotion Marketing Division to ensure that we train our students to produce high-quality output that has market value and matches market standards.

Conclusions

The simple problem of skill shortages in the Indian economy is being depicted as conceptually complex, but it is exacerbated by inappropriate government policy and the lackadaisical approach of industry, which creates confusion. One result, as I said earlier, is that the skills sector is passing through a phase of irrational exuberance and attracting players who are treating skills development and VET as a part of their business model instead of aiming to create a model business.

If this situation continues, it will lead to a crisis in outcomes just like those that have already resulted from poorly thought out, patchy, and one-size-fits-all policy initiatives. India, so proud of its demographic dividend, will sooner or later be confronted with the truth that demographic disaster is also likely, unless it puts dynamic and appropriate policy initiatives into place in the skills development and VET sector.

CUGT has had both qualitative and quantitative success, but if we are to succeed in the long term—keeping our institutions sustainable, scalable, and replicable—we will need extensive and well-planned support from the government, from international agencies, and most importantly, from industry.

We look toward a paradigm shift in the skill development and VET sector, and it will be accomplished when one or more of our students, starting as school dropouts but trained by CUGT, is awarded a PhD on the basis of his or her competency. We believe this will happen within the next eight to ten years. That is our vision for ourselves, and for the sector at large.

References

DEIS [Development Education (International) Society] (2008–2009). Organisation website. http://deispune.org/.

GOI [Government of India], Planning Commission (2008). *Eleventh Five-year Plan: 2007–12*. New Delhi: Oxford University Press. http://planningcommission.nic.in/plans/planrel/fiveyr/11th/11_v2/11th_vol2.pdf.

Gram Tarang Roshni (2013). *Skill training in left-wing extremist affected districts of India*. Video. http://www.youtube.com/watch?v=lHuoLTpxHw8&feature=player_detailpage.

Hajela, R. (2012). *Shortage of skilled workers: A paradox of the Indian economy*. SKOPE Research Paper No. 111. Oxford: COMPAS, University of Oxford.

Jayachandran, U. (2007). How high are dropout rates in India? *Economic and Political Weekly*, March 17. http://eledu.net/rrcusrn_data/How%20High%20are%20drpouts%20rates%20in%20india.pdf.

Maslow, A. (1943). A theory of human motivation. *Psychological Review, 50*, 370–396.

NIOS [National Institute of Open Schooling] (2012). *Framework for recognition of prior learning*. Noida: NIOS, Ministry of Human Resource Development, Government of India. http://www.nios.ac.in/media/documents/Framework%20for%20RPL%20combined.pdf.

Smith, A. (1776). *The wealth of nations: An inquiry into the nature & causes of the wealth of nations*. London: W. Strahan and T. Cadell. http://www.goodreads.com/work/quotes/1373762-an-inquiry-into-the-nature-and-causes-of-the-wealth-of-nations.

UGC planning to replace BA, BSc with vocational courses. *India Education Review*, 27 Nov. 2013. http://www.indiaeducationreview.com/news/ugc-planning-replace-ba-bsc-vocational-courses/13792.

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