There are several ongoing trends that affect the world and will shape the future in the next few decades. Technology’s exponential growth is rapidly compounding the problems via automation and offshoring which are affecting the labour market. At the same time, technology provides opportunities for global collaboration and progress, when people are well equipped to use it to their advantage. The global economic crisis, with high levels of unemployment, in particular among youth, has added urgency to fostering better skills. Additionally, rising income inequality, largely driven by inequality in wages between high and low-skilled workers, also needs to be addressed. Globalisation plays a role too, by expanding access to pools of low-cost talent and creating a greater need for workers with higher levels of education and specific skills in advanced economies. The most promising solution to tackling these challenges is investing effectively in the development of the right skills. Labour market forecasting and changing skills demand suggest that people are required to master new competencies in order to adapt to new trends and circumstances and thrive in an innovation-driven economy. In order for the economy to remain competitive, it needs to transform itself from knowledge-based economy into a learning-based economy where its citizens will not only generate knowledge but will also know how to apply it, with the appropriate behaviour.

In this paper, we explore the current trends shaping the labour market, the forecast for skills demand and supply according to these trends, the role of skills in labour market outcomes and lastly the competencies students should learn in order to thrive in the 21st century labour market. We look into how these trends affect OECD countries and, based on data availability, zoom in on the Netherlands.

1. CURRENT TRENDS

In the following section we explore trends that are influencing employment and shaping how work is done: the impact of technology, globalisation (internationalisation), employers’ flexibility in how they use labour, the increased need for workers with higher levels of education and specific skills in advanced economies (intensification) and disparity in income growth. The challenge for advanced economies is understanding how work is changing and finding ways to prepare as many workers as possible for the jobs of the future.

1.1 Technology is changing the nature of work

The impact of computing technology on labour productivity and skills demand

Automation
Technology is changing the nature of work and increasing both labour productivity and value added. Information and communication technologies (ICT) polarize labour markets, by increasing demand for the highly educated at the expense of the middle educated, with less effect on low-educated workers. Jobs involving routine cognitive tasks typically occur in the middle of the skill distribution and are susceptible to substitution by technology, whereas jobs involving non-routine tasks that
cannot yet be carried out by technology occur either at the low or high end of the skill distribution, depending on whether the non-routine tasks require physical or cognitive skills (Autor, Levy and Murnane, 2013). This trend is caused by ICT substituting routine tasks while complementing non-routine cognitive tasks. As shown in Exhibit 1, the labour market increasingly demands higher order, non-routine analytical and interpersonal skills.

Exhibit 1.


Source: Autor, Levy and Murnane (2013)

At the same time, the ongoing fall in demand for routine cognitive tasks causes polarized shifts in employment. As a result, there is a labour market ‘disaggregation’ with an increased number of occupations at the high and low ends of the skill distribution and decreased employment shares for occupations in the middle skills distribution. Thus, for example, jobs such as a bank teller or retail cashier that can be scripted or standardised are automated. On the other hand, interaction jobs including both high-skill and low-skill positions, have been the fastest-growing category of employment in advanced economies. Many of these interaction jobs have been added in non-tradable sectors such as health care, government services and education. These sectors are not exposed to global competition and the nature of such work has not changed dramatically over the past few decades. In the United States, for example, over the past decade nearly five million interaction jobs were created while more than three million production jobs disappeared (MGI, 2012).

This contrast is likely to evolve even more rapidly as the technological capabilities increase exponentially and thus jobs that will be created in the future are increasingly unlike those of the past. The continuing transformation of jobs by technology means that worker skills need to evolve even more quickly and the opportunities for unskilled workers will continue to decline in all but the very poorest nations. Therefore, continuous progression in government policies regarding education and skills will be essential.

Robotics

According to the International Federation of Robotics (2006), the price of robots fell by approximately one half in six major developed economies from 1990 to 2005. The rapid decline in robot prices led to its increased utilisation in various industries, mostly in transport equipment, chemicals and metal industries. A study conducted from 1993-2007 across 17 countries focused on the impact of robots at work. Exhibit 2 reports mean changes by country in robot densities with the leading country Germany (about 2.7), followed by Denmark (about 1.6) and Italy (about 1.4). In the Netherlands, the impact of robots at work is not significant with mean changes of about 0.5. By 2007, industrial robots were employed in all the seventeen countries of the sample. From 1993-2007
the mean robot density analysed across the seventeen countries increased by more than 150 percent.

Exhibit 2.

<table>
<thead>
<tr>
<th>Country</th>
<th>Δ(#robots/H)</th>
<th>Δ ln(VA/H)</th>
<th>Δ ln(VA)</th>
<th>Δ ln(H)</th>
<th>Δ ln(K)</th>
<th>Δ ln(wH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>0.12</td>
<td>0.22</td>
<td>0.34</td>
<td>-0.12</td>
<td>0.72</td>
<td>-0.15</td>
</tr>
<tr>
<td>Austria</td>
<td>0.61</td>
<td>0.51</td>
<td>0.32</td>
<td>-0.19</td>
<td>0.02</td>
<td>-0.15</td>
</tr>
<tr>
<td>Belgium</td>
<td>1.23</td>
<td>0.29</td>
<td>0.20</td>
<td>-0.09</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Denmark</td>
<td>1.57</td>
<td>0.19</td>
<td>0.17</td>
<td>-0.02</td>
<td>0.51</td>
<td>0.00</td>
</tr>
<tr>
<td>Finland</td>
<td>1.05</td>
<td>0.43</td>
<td>0.39</td>
<td>-0.04</td>
<td>0.40</td>
<td>0.04</td>
</tr>
<tr>
<td>France</td>
<td>1.20</td>
<td>0.29</td>
<td>0.14</td>
<td>-0.15</td>
<td>0.26</td>
<td>-0.06</td>
</tr>
<tr>
<td>Germany</td>
<td>2.73</td>
<td>0.28</td>
<td>0.02</td>
<td>-0.26</td>
<td>0.04</td>
<td>-0.24</td>
</tr>
<tr>
<td>Greece</td>
<td>0.03</td>
<td>0.16</td>
<td>0.04</td>
<td>-0.12</td>
<td>.</td>
<td>0.05</td>
</tr>
<tr>
<td>Hungary</td>
<td>0.08</td>
<td>0.56</td>
<td>0.37</td>
<td>-0.20</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Ireland</td>
<td>0.10</td>
<td>0.44</td>
<td>0.65</td>
<td>0.20</td>
<td>0.94</td>
<td>0.28</td>
</tr>
<tr>
<td>Italy</td>
<td>1.39</td>
<td>0.17</td>
<td>0.10</td>
<td>-0.06</td>
<td>0.43</td>
<td>-0.04</td>
</tr>
<tr>
<td>Netherlands</td>
<td>0.54</td>
<td>0.24</td>
<td>0.19</td>
<td>-0.05</td>
<td>0.39</td>
<td>0.04</td>
</tr>
<tr>
<td>South Korea</td>
<td>1.25</td>
<td>0.71</td>
<td>0.45</td>
<td>-0.26</td>
<td>-</td>
<td>-0.16</td>
</tr>
<tr>
<td>Spain</td>
<td>1.21</td>
<td>0.13</td>
<td>0.31</td>
<td>0.18</td>
<td>0.48</td>
<td>0.26</td>
</tr>
<tr>
<td>Sweden</td>
<td>0.80</td>
<td>0.43</td>
<td>0.46</td>
<td>0.04</td>
<td>0.78</td>
<td>0.07</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>0.34</td>
<td>0.26</td>
<td>0.14</td>
<td>-0.12</td>
<td>0.54</td>
<td>-0.03</td>
</tr>
<tr>
<td>United States</td>
<td>0.97</td>
<td>0.27</td>
<td>0.28</td>
<td>0.01</td>
<td>0.60</td>
<td>0.05</td>
</tr>
<tr>
<td>Mean</td>
<td>0.90</td>
<td>0.33</td>
<td>0.27</td>
<td>-0.06</td>
<td>0.47</td>
<td>0.02</td>
</tr>
</tbody>
</table>

H stands for million hours worked. Value added (VA), capital services (k), and the wage bill (wH) are measured in millions of 2005 US$, converted from local currencies using 2005 nominal exchange rates where applicable. Country-level and overall means are weighted by each industry’s 1993 share of hours within a country.

Source: Georg Graetz, Guy Michaels, Robots at Work, Center for Economic Performance, London School of Economics and Political Science, March 2015

The study shows that across 17 countries robot densification from 1993-2007 raised annual growth of GDP and labour productivity by 0.37 and 0.36 percentage points, respectively (Graetz & Michaels, 2015). The overall contribution of robots is less than the upper range of estimates of ICT’s contribution to EU and US labor productivity growth from 1995-2005, which O’Mahony and Timmer (2009) estimate at 0.6 and 1.0 percentage points, respectively. But importantly, the total value of ICT capital services is at least five times larger than that of robot services.

While the impact of robots on labour productivity is rather small, robot densification affects employment in various ways. Evidence shows that robots reduce the hours worked by low-skilled and (to a lesser extent) middle-skilled workers, while not having any effect on hours worked by high-skilled workers. At the same time, the study shows that unlike ICT, robots do not polarise the labour market, since their negative effects on the least educated are no smaller than those on the middle-skilled. (Michaels, Natraj, and Van Reenen (2014) and Autor (2014).

During the time this study was conducted, industrial robots were used just under a third of the economy and service robots were in their infancy. If the quality-adjusted prices of robots keep falling at a rate similar to that observed over the past decades, and as new applications are developed, there is every reason to believe that they will continue to increase both labor productivity and value added. Recently, the development of robots has been increasingly directed towards services. Areas that are experiencing a particularly rapid expansion include medical robots, factory logistic systems, and unmanned aerial vehicles, popularly known as drones. There is also a lot of potential for increased use of robots in new industries which suggests that likely contribution of robots to future growth is significant. At the same time, study findings of congestion effects in robot use suggest that increased robot densification is not the only answer for growth (Graetz & Michaels, 2015).

The impact of communication technology on employment

Flexibility
By using ubiquitous broadband connections and other technology, many interaction jobs can be concluded virtually, whether from the road, remote offices or a worker’s home. This gives employers
unprecedented flexibility in how they use labour and they can change where and when jobs are carried out. Managing employees and contract workers over the Internet, companies now have the ability to make labour more of a variable cost, rather than a fixed one, by engaging workers on an as-needed-basis. Across the OECD countries, part-time and temporary employment among prime age workers has risen 1.5 to 2 times as fast as total employment since 1990. There is a range of new intermediaries emerging to supply high-skill talent for short-term assignments and to tap lower-cost pools of talent in less costly locations.

**Offshoring**

The migration of jobs overseas for the purpose of lowering labour costs is another trend affecting employment. According to Blinder, movement of the service sector from the United States and other rich countries to other (mostly poorer) nations is likely to become a major one in the coming decades, and likely to be referred to as a new industrial revolution (2006). He estimates that roughly 25% of all the jobs in the United States are potentially offshorable, the majority being in the service sector. While migration of manufacturing jobs is a common phenomenon, offshoring service sector jobs is a recent trend caused mainly by rapid advances in computerised telecommunications technology (e.g. the Internet). In terms of empirical findings, offshorability appears to be particularly prevalent in production work and in office and administrative jobs. By industry group, it is most common in manufacturing, finance and insurance, information services, and professional and technical services. As Exhibit 3 shows, more educated workers appear to hold somewhat more offshorable jobs. (Blinder & Kruger, 2009).

Exhibit 3.

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Percent of all respondents</th>
<th>Percent offshorable</th>
<th>Inferred</th>
<th>Externally Coded</th>
</tr>
</thead>
<tbody>
<tr>
<td>No high school diploma</td>
<td>9.4</td>
<td>18.6</td>
<td>14.3</td>
<td>11.8</td>
</tr>
<tr>
<td>High School diploma or GED</td>
<td>30.2</td>
<td>17.3</td>
<td>19.8</td>
<td>19.3</td>
</tr>
<tr>
<td>Some college (no degree)</td>
<td>13.9</td>
<td>22.4</td>
<td>22.1</td>
<td>23.8</td>
</tr>
<tr>
<td>Vocational/Technical/Associate degree</td>
<td>11.4</td>
<td>22.9</td>
<td>22.8</td>
<td>17.1</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>21.6</td>
<td>34.6</td>
<td>42.8</td>
<td>26.4</td>
</tr>
<tr>
<td>Advanced degree or professional school</td>
<td>13.5</td>
<td>37.0</td>
<td>38.5</td>
<td>16.9</td>
</tr>
</tbody>
</table>

The key attribute to consider while offshoring is not the level of skill required for the job, but whether the service can be delivered to its user electronically over long distance. Thus, jobs that can be broken down into simple, routine tasks are easier to offshore than jobs requiring complex thinking, judgement and human interaction. Nevertheless, there are complex jobs such as statistical analysis or computer programming requiring a high level of skills and human judgement that can be also offshored. Hence, personal/impersonal distinction is more relevant to the offshoring issue than is the routine nature of tasks. The shift toward service offshoring is a potentially dramatic labour market transformation and since ICT keeps getting better and cheaper, the scope for offshoring is estimated to increase consistently. In summary, low-skill routine types of jobs with impersonal delivery are most vulnerable to be offshored and automated. (Exhibit 4).

Exhibit 4.
1.2 The global financial crisis and its impact on (un)employment

The global financial and economic crisis has led to alarmingly high unemployment and underemployment. The current high levels of unemployment are primarily the result of failures of macroeconomic policy. According to the ILO, there are 200 million people out of work around the globe. Approximately 40 million of these people live in advanced economies and tens of millions more in those countries are underemployed or have become discouraged and dropped out of the labour force (McKinsey Global Institute, 2012). Especially, widespread youth unemployment presents a daunting challenge for Europe. Over 5 million young people under 25 were unemployed in the EU-28 area in 2014 which represents an unemployment rate of 21.7% (23.2% in the euro area). This is more than twice as high as the adult unemployment rate (9.0%). Moreover, 7.5 million young Europeans between 15 and 24 are neither in employment, nor in education or training (NEETs). For young people, unemployment has long-term effects and is putting an entire generation at risk. In the Netherlands, youth unemployment at around 11% is relatively low in comparison to other OECD countries.

Exhibit 5.

Skills mismatch in the labour market

Despite the alarmingly high rate of unemployment, more than a third of global companies reported difficulties in filling open positions in 2014, owing to shortages of people with key skills (Manpower, 2014). The latest European company survey, carried out in spring 2013, found that about 40% of firms across the EU had difficulty finding staff with the right skills. (Cedefop, 2014). However, the
skills mismatch is not only about skill shortages. It also concerns the extent to which people work in jobs matched to their qualifications and skills. Other factors than skill deficits are responsible for high unemployment such as imbalance between supply of and demand for different skills. Exhibit 6 shows imbalances in the EU labour market among adult employees (aged 25-64). Broad skill demand and supply trends indicate that there are more low-educated employees in the EU than there are jobs at that level. The number of jobs usually requiring a tertiary qualification is roughly in line with the number of highly-educated employees available. But a significant imbalance lies between jobs requiring medium-level qualifications and people qualified at that level.

Exhibit 6.

<table>
<thead>
<tr>
<th>% high-educated jobs</th>
<th>% high-educated employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>32%</td>
<td>33%</td>
</tr>
<tr>
<td>% medium-educated jobs</td>
<td>% medium-educated employees</td>
</tr>
<tr>
<td>40%</td>
<td>48%</td>
</tr>
<tr>
<td>% low-educated jobs</td>
<td>% low-educated employees</td>
</tr>
<tr>
<td>21%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Source: Cedefop based on EU labour force survey micro data.

A gap between labour market and education system

A critical reason for youth not getting the skills employers need is that education providers, young people, and employers do not understand one another. In general, providers, employers and young people operate in parallel universes, which is visible to a greater extent in Europe. As Exhibit 7 shows, 74 percent of education providers were confident that their graduates were prepared for work, yet only 38 percent of youth and 35 percent of employers agreed. Many students are not mastering the basics, with businesses reporting a particular shortage of “soft” skills such as spoken communications and also problems with work ethic. Furthermore, too many young people are taking courses that lead to qualifications for which there is reduced demand (McKinsey, 2014). Outside of the UK and Germany, only 50 percent of European employers report interacting with education providers several times a year or more.

Exhibit 7.
In order to reduce skills mismatches, education systems need to increase their responsiveness to labour market needs. This includes policies to increase high-quality apprenticeships and internships. Evidence shows young people on such schemes are more likely to acquire useful skills and attitudes to find suitable work. At the same time, co-operation between governments, employers and unions in managing education and training systems should also be strengthened to adapt curricula quickly to meet the changing skills demand. Such cooperation should develop VET at all levels, including tertiary, and cover short-term training to swiftly address skill deficits, for example in innovative sectors (Cedefop, 2014). The goal of reducing skills mismatches requires reforms to increase the responsiveness of education and training systems to labour market needs, but is ultimately dependent on the provision of better workplaces and good quality jobs.

1.3. Inequality and its impact on the economic growth

Technology and globalisation have increased demand for highly skilled workers, pushing up wages for these people and reducing demand for the less-skilled. Other factors are driving growing income polarisation as well. One is shifting patterns in family formation: across the OECD, the proportion of single-headed families has risen by 25 percent since the 1980s, limiting the rise of household income. At the same time, marriage rates rise along with educational attainment and high earners are more frequently marrying one another, further raising household incomes of wealthy households and widening the income gap (OECD, 2011). As Exhibit 8 shows, since the mid-1980s, incomes have risen faster for the top 10 percent of households than for the bottom 10 percent in most OECD nations. Income growth for the bottom 10 percent has barely increased in some countries including the United States, Germany, Sweden, and the Netherlands.
The gap between rich and poor is at its highest level in most OECD countries in 30 years. Today, the richest 10% of the population in the OECD area earn 9.5 times more than the poorest 10%. By contrast, in the 1980s the ratio stood at 7:1. These rising income disparities are worrying as they have an impact on countries future economic growth and social cohesion. The biggest factor for the impact of inequality on growth is the gap between lower income households and the rest of the population. As Exhibit 9 shows, an increasing number of jobs are meant for highly-skilled workers.

However, it is not just poverty or the incomes of the lowest 10% of the population but the bottom 40% which includes the vulnerable lower-middle classes who are at risk of failing to benefit from and contribute to recovery and future growth. The evidence suggests that when inequality rises, economic growth falls. By impeding human capital accumulation, income inequality undermines education opportunities for disadvantaged individuals, lowering social mobility and hampering skills development. Analysis drawing from education data and the recent OECD Adult Skills Survey (PIAAC) shows that the human capital of people whose parents have low levels of education deteriorate, as
income inequality rises. By contrast, there is little or no effect for the human capital of people with middle or high levels of parental education. These patterns hold for both the quantity of education (e.g. schooling years) and its quality (e.g. skills proficiency). In sum, the analysis suggests that inequality significantly shapes the opportunities of education and upward mobility of disadvantaged individuals. Policy needs to confront the historical legacy of underinvestment by low income groups in formal education. Strategies to foster skills development must include improved job-related training and education for the low-skilled, over the whole working life (OECD, 2014).

In summary, globalisation and technology have greatly increased demand for highly skilled workers, increasing wages for these people and reducing demand for the less-skilled. Increased global interconnectivity puts diversity and adaptability at the centre of organisational operations. Technology is transforming the nature of work and raising productivity which means that worker skills need to evolve more rapidly. Companies are focusing on raising productivity in high-skill interaction jobs and are applying efficiency measures which lead to the intensification of the working environment. At the same time, there is an increasing flexibility in the way work is being carried out which allows employers to decide how and when they want to use the labour. Additionally, growing mismatches between worker skills and jobs, unemployment and disparity in income growth have significant impact on economic growth.

2. LABOUR FORECASTING

In the long term, skills will be a driver for countries’ competitiveness and will be a source of future prosperity. Therefore, insights into skill demand and supply forecast will help policy-makers to take informed decisions on their future. Forecasts identifying major economic and socio-demographic trends can examine their implications on the labour market, occupations and qualifications. The European Center for the Development of Vocational Training (Cedefop) is an agency of the European Union that has produced forecasts up to 2020. They predict that by 2020, Europe is will see a return to job growth which is anticipated to be faster than the increase of labour supply.

2.1 Skill demand trends
The forecast predicts there will be around 83 million job opportunities in EU-27+, including some 8 million newly created jobs. The trend towards more service-oriented economies will continue and most new job growth will be in the service sector, as shown in Exhibit 10. Similarly, in the Netherlands, job growth is anticipated to be mainly in business and other services and distribution and transport.
According to the demand forecast, sector development will mirror trends in occupational growth and there will be job openings for all occupations even those whose employment rate has been in long-term decline, such as craft and related trades (Exhibit 11). The most demanded occupations in the Netherlands are expected to be professionals, associate professionals and service and market sales workers.

In general, the total number of job openings will be positive due to replacement demand; however, results indicate a high probability of job polarisation as new jobs will be created mostly at the top or bottom of the job spectrum than equally distributed. As Exhibit 12 shows, top five occupational groups most in demand in the period up to 2020 account for around 90% of the new jobs and approximately 40% of total job opportunities.
Exhibit 12.

Highly-qualified technicians and associate professionals are becoming increasingly important in the modern economy. In services, polarisation between demand for high-skilled and low-skilled jobs is quite sharp. Some previously low-skill jobs now require medium- or even high-level qualifications. The changing nature of jobs reflects the types of tasks that people have to carry out. Many jobs require a combination of universal core competences and specialist skills. Changes in work organisation have led to more multiskilling and increased demand for personal, mathematical, scientific and analytical skills (Cedefop, 2012).

2.2 Skill supply trends

By 2020, more than 80% of the total labour force will have at least medium-level qualifications. The fastest growth will be of people acquiring high-level qualifications. Results suggest an increase of about 20 million people in the labour force holding high-level qualifications in EU-27+ between 2010 and 2020. Exhibit 13 demonstrates that this will raise the proportion of people in the labour force with high-level qualifications from 27.3% in 2010 to 37% in 2020.

Exhibit 13.

Increases in qualification levels are generally similar across countries, with some variations, notably for parts of central and Eastern Europe (Exhibit 14). In the same way, the Netherlands expects an increased growth in high qualification levels.

Exhibit 14.
2.3 Skills imbalances

According to the forecast, the economic slowdown has constrained economic growth and skill demand. As a result, supply of higher qualifications will increase faster than demand for them. Combined with weak employment demand, these trends are increasing competition for available jobs. This makes it more difficult for some people with high- and medium-level qualifications to find the kind of jobs they would like, especially in the short term. In such circumstances, people may accept jobs they are overqualified for and, occasionally, part-time work or other less favourable conditions, including lower wages. Under these circumstances, highly-qualified people sometimes displace lower-skilled people from jobs. However, this is probably only a temporary situation due to a high unemployment in which many skilled people are out of work but there are trends suggesting the importance of higher level of skills in the future.

In all countries, more than half of all workers are employed in jobs for which their level of skills, education or their field of study is inappropriate. The total incidence of mismatch varies significantly across countries. In Spain, figures exceed 70% while in Austria and the Netherlands 53% of youth are mismatched. (Exhibit15).
Exhibit 15.
However, it is important to understand that skill mismatch is more than a discrepancy between labour market needs and particular skill levels as measured by qualifications. It is often about the lack of the ‘right’ skills and the mismatch between what people study and the subjects that the labour market requires. Therefore, partnerships of various stakeholders, including education and training providers, social partners and employment services are necessary to improve labour market intelligence and co-ordination. Better vocational guidance and counselling services can help people make informed choices about their careers and the education and training they need. (Cedefop, 2012).

By 2020 Europe expects to have the most highly-qualified labour force in history. The challenge will be to prevent high-level skills from going to waste. As jobs are becoming more skill-intensive and routine tasks are increasingly carried out by technology, there will be greater need for non-routine personal skills.

3. THE ROLE OF SKILLS ON LABOUR MARKET OUTCOMES AND BEYOND - EVIDENCE FROM PIAC AND PISA

Skills do matter for labour market outcomes. What people know and how they can apply what they know has a major impact on their lives. As Exhibit 16 illustrates, people with low foundation skills levels face much greater risk of experiencing economic disadvantage, higher likelihood of unemployment and dependency on social welfare.

Exhibit 16.
Skills have become the global currency of 21\textsuperscript{st} century economies. Thus, it is not only educational attainment but also the type of skills acquired and skills’ proficiency that affect the probability of finding a job and its level of pay. All four skills areas - education, information-processing, generic skills and those related to field of study are found to be significantly and independently associated with the level of hourly wages. There has been also evidence that individuals with similar levels of educational attainment vary in their information-processing proficiency which may reflect different innate abilities as well as difference in the quality and degree of skills acquisition. Nevertheless, educational attainment is a key signalling device for an employer and it has a strong effect on entry wages. However, over time formal qualifications become less important and the role of information-processing skills becomes more important for prime-aged and older workers, eventually exceeding the influence of education (OECD, 2014).

3.1 PIAAC evidence

Most of the existing research into the link between skills and labour market outcomes uses educational attainment as a proxy for human capital. The strength of the OECD’s Programme for the International Assessment of Adult Competencies (PIAAC), a survey of adult skills over the full lifecycle in 24 countries, is the fact that the impact of different types of skills can be assessed separately (OECD, 2014). Analysis of the results demonstrates the importance of cognitive skills such as literacy, numeracy and problem solving in technology-rich environments on completion of tertiary education and labour market outcomes such as income and unemployment. These are the information-processing skills that are necessary for successful participation in the labour market, further learning as well as prosperous social and civic life. Additionally, data are also collected on a range of other generic skills such as co-operative skills, influencing skills, self-organising skills, learning at work, dexterity, task discretion and physical skills (Exhibit 15).
For youth, 11% of the returns to education, the interest rate that an individual can expect to receive on the investment made by spending time and money to obtain an education, can be attributed to the greater proficiency in information processing skills. Together, information-processing and generic skills explain about 36% of the return to education for youth. According to Pasche, 50% of the return to schooling can be attributed to information-processing skills, and argues that even this is likely to be a lower bound as it only relates to basic cognitive skills (Pasche, 2008).

3.2. PIAAC results in Netherlands

The results from the PIAAC survey show that adults in the Netherlands have high proficiency in literacy, numeracy and problem solving skills in technology-rich environments compared with adults in the other countries participating in the survey. (OECD, 2013b).

**Literacy**
Roughly 18% of adults aged 16-65 attain levels 4 and 5 of proficiency in literacy and some 41.5% are proficient at level 3 (Exhibit 18). Young adults (aged 16-24) have higher proficiency in literacy than older adults. They are among the top performers in the survey with an average lower than their peers in Japan, who have the highest score, but similar to that of adults in Finland and Korea.
Exhibit 18.

**Numeracy**

Approximately 17% of adults (aged 16-65) in the Netherlands achieve levels 4 or 5 in numeracy and around 39% attain level 3 (Exhibit 19). Young adults (aged 16-24) show the highest proficiency average, along with their peers in Finland, Japan, Flanders (Belgium) and Korea.

Exhibit 19.

**Problem solving**

PIAAC defines problem solving in technology-rich environments as using digital technology, communication tools, and networks to acquire and evaluate information, communicate with others,
and perform practical tasks (OECD, 2012). Some 7.3% of adults in the Netherlands are proficient at level 3, the highest proficiency level, in problem solving skills in technology-rich environments while around 34% attain proficiency level 2 in problem solving (Exhibit 20). Roughly 58% of young adults attain levels 2 or 3 in these skills. Around 7% of Dutch adults indicated that they had no previous experience with computers or lacked basic computer skills while 45% of adults scored at or below level 1 in problem solving in technology-rich environments.

Exhibit 20.

3.3 PISA results in the Netherlands

In the Netherlands, the average performance in reading of 15-year-olds is 511 points, compared to an average of 496 points in OECD countries. Girls perform better than boys with a statistically significant difference of 26 points (OECD average: 38 points higher for girls). On average, 15-year-olds score 523 points in mathematics, the main topic of PISA 2012, compared to an average of 494 points in OECD countries. Boys perform better than girls with a statistically significant difference of 10 points (OECD average: 11 points higher for boys). In science literacy, 15-year-olds in the Netherlands score 522 points compared to an average of 501 points in OECD countries. Boys perform better than girls with a non-statistically significant difference of 3 points (OECD, 2012).

As evidence shows, foundational skills do matter for labour market outcomes. According to PISA and PIAAC results, skills such as numeracy, literacy and problem solving are associated with finding a job and its level of pay. The Netherlands performs above OECD average in both surveys. However, these measured skills alone are not sufficient in order to remain competitive in the future labour market. Thus, in the next section we will explore what is the set of knowledge, skills and competencies that students need to possess in order to thrive in the 21st century economy.
4. 21st CENTURY COMPETENCIES THAT FOSTER LABOR MARKET OUTCOMES AND LIFETIME SUCCESS

Among OECD countries, there is an increasing awareness about the importance of 21st century competencies that will prepare students for successful employment and life beyond. According to the European Commission’s Cedefop glossary, a competence is more than just knowledge or skill. It is a broader concept that may comprise skills, as well as attitudes and knowledge. A competence is the ability to apply learning outcomes adequately in a defined context such as education, work, personal or professional development. It is not limited to cognitive elements; it also encompasses functional aspects (involving technical skills as well as interpersonal attributes (social and organisational skills) and ethical values. (2008).

According to a crosswalk review conducted by Pellegrino et al., the 21st century competencies that prepare youths for life and work contain three main domains: cognitive, interpersonal and intrapersonal skills. The Cognitive domain consists of cognitive processes and strategies, knowledge and creativity. Cognitive processes include critical thinking, problem solving, reasoning, decision making and adaptive learning; knowledge means information literacy, communications technology literacy, oral and written communication, active listening and lastly creativity which translates into innovation. Intrapersonal competencies encompass intellectual curiosity, conscientiousness and positive core self-evaluation. Intellectual curiosity translates into flexibility, adaptability and continuous learning. Conscientiousness is comprised of initiative, self-direction, responsibility, perseverance, productivity and grit as well as ethics, integrity, citizenship and career orientation. Positive core self-evaluation means self-monitoring, self-evaluation and self-reinforcement. Interpersonal competencies cover teamwork and collaboration, which includes interpersonal skills, empathy, negotiation and leadership. Economists tend to merge all the skills other than IQ into the category of non-cognitive skills, development psychologists refer to them as personality traits, education experts talk about 21st century competencies and some others call them character (2012). Whatever their label, all of these competencies are important for the holistic development of a personality able to contribute in the current labour market and society. James Heckman (2006) conducted an economic analysis and reported that both cognitive and social and emotional skills (SES) contribute to social and economic success. For many dimensions of behaviour, SES are as important, if not more important, than cognitive ability. He challenges a pervasive view in economics and psychology literature that cognitive ability plays a dominant role in explaining personal achievement. Even though cognitive skills explain much more of the variance of wages, their effects on wages are similar to the effects of the SES. In fact, social and emotional skills are equally strong in many outcomes and are stronger for some outcomes. (2006). According to the research of Lindqvist and Vestman (2011), SES is considerably more important than cognitive abilities for success in the labour market. They found strong evidence that men who fare poorly in the labour market, in the sense of unemployment or low annual earning, lack social and emotional dimensions rather than cognitive ability. Nevertheless, developing a set of competencies leading to success in employment is a multidimensional challenge. In the following sections, we will discuss the type of knowledge, skills and attitudes, which, according to existing research, seem to be the highest predictors of success in the labour market and beyond.

3.1. Core Knowledge (Foundational skills)

Foundational skills like literacy and numeracy are of course essential for successful transition into higher education and the labour market, as Exhibit 21 shows. Thus, 21st century education must be founded on the solid ground of content knowledge.

Exhibit 21.
Acquisition of these skills has been traditionally a main focus of education systems around the world. Historically, being able to understand written text and quantitative relationships was sufficient for entering the workplace. Today, these skills represent only the starting point on the path towards successful participation in the 21st century labour market (WEF, 2015).

**Relevancy**

Even though core subjects are essential, trying to cover too many topics may actually prevent sustained engagement with a discipline’s core ideas. It is the depth of engagement on which true subject mastery depends. Linda Darling-Hammond, an educational researcher, has found that the US covers many more topics than countries that have higher levels of achievement in international tests. Japanese students, for example, study four or five mathematical concepts intensely over a school year, while American students are expected to master a new concept every week (P21, 2007). As the Center for Curriculum Redesign (CCR) states, there is a profound need to rethink the significance and applicability of what is taught and to strike a better balance between the conceptual and the practical. Relevance is critically important to economic and social needs, not only to satisfy student wishes. In the recent survey conducted by Education and Employers research on the question of how should schools respond to the current demands, Andreas Schleicher, Director for Education and Skills and Special Advisor on Education Policy to the Secretary-General at the OECD, expressed his view on the importance of core subjects. He mentioned that maths is a prime example of a mismatch that exists between educational approaches and the working world. There is a big misalignment in ‘how’ and ‘what’ is being taught in maths and the way it serves society. For example, computer programming and structured algorithms are largely overlooked by schools. In order to keep pace, maths needs be taught through concepts such as probability or risk management. From the perspective of the modern working world, content categories like algebra and geometry are unnatural and archaic (Mann, 2015).

**Interdisciplinary**

The relevant knowledge of the core subjects such as maths, reading, language, arts, history, geography, science and economics is essential. Cognitive science suggests that students master core subjects best when their instruction emphasizes depth over breadth of coverage. Howard Gardner stresses the importance of the ‘disciplined mind’, the mastery of at least one scholarly discipline, craft or profession. In the interconnected 21st century, we know that we must draw on multiple knowledge domains to find solutions for many of today’s problems. This ability to span multiple
domain boundaries is highly valued in the modern competitive workplace (P21, 2007). As the economy is shifting at a rapid rate and jobs that were once done by humans are being outsourced to machines and computers, people need to have the ability to work across multiple disciplines. Making sense of complex problems by looking at them from different disciplinary/cultural perspectives is not something that a computer will be able to do anytime soon. Broad knowledge is, therefore, essential for the future labour market. One of those future-proof skills is the ability to work across multiple disciplines, or in other words, being a “polymath”. For example, IBM leads an initiative in collaborating with universities to foster development of a new type of 21st century knowledge professional, or what they refer to as a “T-shaped person”. Regardless of the profession, a T-shaped person must be interdisciplinary rather than a narrowly-focused specialist. Although they must have deep knowledge in their specialisation (the vertical axis of the T), they also need to have a broad range of related disciplines (the horizontal axis) to allow them to see contextual links and constructively participate in interdisciplinary teams (2009).

3.2. Modern knowledge (21st century themes)
In addition to the essential knowledge, ‘modern’ knowledge is also critical to economic and societal needs. As knowledge crosswalk (Exhibit 22) suggests, there seems to be an alignment between CCR, Partnership for 21st Century Skills (P21) and the EU reference framework in terms of generic themes that are essential to prepare students for the demands of adult life. It stresses interdisciplinary topics focused on four themes with special relevance to modern life: ICT literacy, financial literacy and entrepreneurship, civic literacy and global awareness.

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<tr>
<td>Traditional Knowledge</td>
<td>Mathematics</td>
<td>Mathematics</td>
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<td></td>
<td>Science</td>
<td>Science</td>
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<tr>
<td></td>
<td>Languages – domestic</td>
<td>Languages – English</td>
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<td>Languages – foreign</td>
<td>Languages – world</td>
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<tr>
<td></td>
<td>Social Studies [History, geography, civics, economics, etc.]</td>
<td>Economics, Geography, History, Government &amp; Civics</td>
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<td></td>
<td>Arts incl. Music</td>
<td>Arts</td>
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<td></td>
<td>Etc. (country-dependent)</td>
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<tr>
<td>Modern Knowledge (Interdisciplinary)</td>
<td>Interdisciplinary Themes: Information, Media and ICT Literacy</td>
<td>Technology</td>
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<td></td>
<td>Technology &amp; Engineering, including:</td>
<td>Digital competence</td>
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<td>Entrepreneurship</td>
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<td>Robotics &amp; A.I.</td>
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<td>Synthetic Biology</td>
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<td>Media/Journalism</td>
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<td>Cinema</td>
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<td>Entrepreneurship, business, personal finance</td>
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<td>Wellness</td>
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<td></td>
<td></td>
<td>Social systems (sociology, anthropology, etc.)</td>
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<tr>
<td></td>
<td>Embedded everywhere</td>
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<tr>
<td></td>
<td>Global literacy</td>
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<td></td>
<td>Information literacy</td>
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<td></td>
<td>Systems thinking</td>
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<tr>
<td></td>
<td>Futures education</td>
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<td></td>
<td>Ethical sense</td>
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Note: CCR approaches Knowledge along all of the following:
- Concepts & Processes
- Methods & Tools
- Branches, Subjects and Topics

ICT, Media and Digital Literacy
Since access to computers and ICT is widespread and growing and they are changing the ways in which public and other services are provided and consumed, familiarity with and use of ICT has become an essential skill students should possess. As evidence from PIAAC shows, proficiency in problem solving in technology-rich environments is associated with the probability of participating in the labour market and being employed, and with higher wages (OECD, 2013). Students also need to understand the forces that shape a myriad of messages from the media that surround them in daily life. Thus, media literacy builds an understanding of the role of media as well as the ability to access, analyse and evaluate media messages in a variety of forms.

Financial, Economic, Business and Entrepreneurial Literacy
Knowing how to make appropriate personal economic choices, understanding the role of the economy in society and using entrepreneurial skills to enhance workplace productivity are an important part of students’ preparation for the demands of adult working life. The European Commission launched the entrepreneurship 2020 Action Plan which aims to unleash Europe’s entrepreneurial potential through entrepreneurial education and training. Entrepreneurial literacy includes universal skills and attitudes as well as more specialized knowledge and business skills. Entrepreneurship refers to an individual’s ability to turn ideas into action. It includes creativity, sense of initiative, innovation and risk-taking, as well as the ability to plan and manage projects in order to achieve objectives. Financial literacy is an essential aspect of entrepreneurial literacy as it may be the main reason why small businesses do not succeed (2015).

Global awareness
Global awareness has grown in importance in the 21st century as economic, social, and cultural connections among countries have increased. To be globally aware, a person must show an understanding of the interrelatedness of people, institutions, and systems. Being able to connect how actions in one area of the world affect other areas is a core part of global awareness. Understanding these aspects of global awareness has been tied to success in the international economy. Students should know how to investigate the world, weigh perspectives, communicate ideas, take action, and apply expertise in order to prosper in a global, multicultural workforce.

Civic Literacy
Participating in civic life through knowing how to stay informed and understanding governmental processes, exercising the right and obligations of citizenship at national and global levels and understanding local and global implications of civic decisions is an important competency that students should possess for successful functioning in 21st century society.

3.3. Higher order thinking skills

Learning academic content is fundamental to education, and mastery of content serves as the basis for higher-order thinking skills. Not only what you know but also what you can do with what you know has become the key differentiator of personal success in modern economies. According to a research study conducted by the Partnership for 21st Century Skills, higher order skills are essential for absorbing knowledge as well as for work performance (2007). Based on the review of various frameworks, there seems to be a reasonable global consensus on what these skills are, as shown in Exhibit 23.

Exhibit 23.
CCR refers to 4 Cs as essential skills for applying knowledge into the practice. According to the survey conducted by the Partnership for 21st Century Skills (P21), out of 2,115 managers and other executives, 75% of the executives stated that the 4 Cs (creativity, critical thinking, communication and collaboration) are essential competencies they look for in their employers mainly due to the increased pace of change in business, the movement toward global competitiveness and the way in which companies are structured (2007).

**Creativity/innovation**

Without creativity, it would be difficult to distinguish humans from other animals. As Csikszentmihalyi said, without creativity, mankind would not progress. Creative individuals are remarkable for their ability to adapt to different situations and to manage with whatever is needed to reach their goals. The hopes of organisations and individuals for the future lie in finding creative solutions to pressing problems, as innovation is what drives the economy today. Innovation contributes to the creation of new jobs and industries. OECD cross-country analysis finds that employment in less productive firms tends to decline, while more productive firms create additional jobs. In the long run, innovation and employment creation go hand in hand, contributing to an inclusive and high-employment economy (OECD, 2010). According to the P21 research, nearly three-fourths of respondents (73%) expect creativity and innovation to increase in importance for future graduates. Employers’ focus on creativity/innovation as an increasingly important future skill corresponds with numerous reports that emphasise the capacity to innovate as the single most important element in maintaining economic growth and competitiveness (2006).

**Collaboration**

Collaboration drives innovation. As Sawyer (2007) observed, every business success - from trendy companies in Silicon Valley through manufacturing firms to highly technical research labs - has been
based on collaboration. The most radical breakthroughs such as television, the airplane and e-mail emerged from a collaborative network of people. And today’s innovations emerge from increasingly complex organisations and interacting teams. According to Sawyer, lone genius is a myth; instead, it is a group genius that generates breakthrough innovation. When people collaborate, creativity unfolds across teams and the whole is greater than the sum of its parts. Thus, teamwork is imperative for the current interconnected work environment.

**Critical thinking/problem solving**

Critical thinking is highlighted in almost every discussion of key competencies for the 21st century. Critical thinking includes inductive and deductive reasoning, as well as making correct analyses, inferences, and evaluations. These competencies are important for deeply understanding academic content, and they also relate to later career performance. Research suggests that for a company to compete in the global economy, it needs workers who will think about how to continuously improve its products, processes or services. According to many executives, at the heart of this continuous improvement process is knowing the right questions to ask (Wagner 2010), a function of critical thinking. Economists Frank Levy and Richard Murnane have described the new world of work in which the most desirable jobs and the ones least likely to be automated or outsourced are the ones that require expert thinking comprised of critical thinking and problem-solving skills (2013).

**Communication**

Communication is identified as a vital 21st century competency by almost all of the surveyed organisations. For example, Pellegrino and Hilton (2013) suggest that communication is essential to facilitate teamwork and lies at the core of empathy, trust, conflict resolution and negotiation. For instance, effectiveness with clients often hinges on effective communication and the teamwork necessary to produce a superior product. Communication skills are especially important in the expanding service economy where relationships with customers and fellow employees are of vital importance. At the same, as technology gives rise to global work teams that span time zones, nations and cultures, it’s more imperative than ever that future graduates will be effective communicators. The importance of communication in the workforce has generated increased focus on these skills in schools.

**3.4 Social-emotional skills (SES)**

An increase in cognitive skills increases the probability of completing tertiary education, finding a job and earning a good salary. However, the modern labour market requires the ability to manage uncertainty and change. In addition to foundational and higher-order skills, students also need willingness and the ability to learn throughout their life, and adapt to an increasingly challenging and uncertain world. Thriving in a structurally imbalanced world is contingent on the ability to adapt to change and recover from failure and the capacity to seize new opportunities. Children with higher levels of social and emotional skills are likely to benefit more from further investments in cognitive skills. Furthermore, young people with a strong social and emotional foundation can better thrive in a highly dynamic and skills-driven labour market by persevering and working hard. They can also be more prepared to face an increasingly challenging world by managing their emotions and adapting to change (OECD, 2015).

Social and emotional skills are also referred to as non-cognitive skills, soft skills, attitudes or character. In the OECD report on *Skills for Social progress*, social and emotional skills are grouped in three categories: achieving goals, working with others and managing emotions. However, categorisation of social emotional skills is somewhat challenging as some of the skills can be a combination of both cognitive and social-emotional competencies, such as communication or collaboration. Essentially, evidence from an analysis of longitudinal studies in nine OECD countries
shows that social emotional skills play a significant role in improving economic and social outcomes and together with cognitive skills play an important role in driving children’s lifetime success (Exhibit 24).

**Exhibit 24.**

| Table 3.3. Cognitive, social and emotional skills contribute to children’s lifetime success |
| --- | --- | --- |
| | Education | Labour market | Social |
| Cognitive skills | High | High | Social |
| Social and emotional skills | Low – Medium | Medium | High |

Source: OECD, Skills for Social Progress, 2015

It is important to note that social and emotional skills do not play a role in isolation; they interact with cognitive skills, cross-pollinate and further enhance children’s likelihood of achieving positive outcomes later in life (OECD, 2015). Below mentioned qualities seem to be associated with general work success and achievement in people’s life.

**Self-awareness (emotional intelligence)**

Emotional intelligence (EI) is a comprehensive expression including a collection of skills and personal qualities that are associated with self-awareness, self-efficacy, self-monitoring, self-evaluation and empathy. Goleman focuses on the importance of emotional intelligence in general work success life achievement. In his book “Working with Emotional Intelligence”, he states that EI can actually be more influential upon an individual’s success in both their personal and professional life than cognitive intelligence. People with high levels of EI abilities are more likely to achieve high levels of success in their workplace, as emotionally intelligent people have been found to feel less job insecurity, lead more effectively, be more adaptable to stressful events, possess better coping strategies and indicate greater sales success than those who have low EI (2010).

**Curiosity (continuous learning, self-directed learner)**

Curiosity helps to motivate and drive people towards continuous learning. Often what students know is not as important as what they want to know. High test scores and academic achievement are preceded by intellectual curiosity, which is the better indicator of success. The desire to learn is one of the most important determinates of how successful people will be in school, in work and in life. Intellectual curiosity is one the top traits employers look for when hiring. A person who will hardly adopt a new database is not as attractive as one who is truly passionate about learning new things. The ability to solve problems and continued dedication to learning new technologies or solutions that can adapt to the constantly changing workplace is more important than specific expertise.

**Conscientiousness (grit, perseverance)**

Measures of conscientiousness, self-control and perseverance capture goal achieving traits. These traits are most highly correlated with desirable educational, career and health outcomes. From the Big Five traits, conscientiousness best predicts overall attainment and achievement. According to Barrick, Mount and Judge (2001), it is a valid predictor of job performance, with average correlations ranging from the mid-0.20s to low 0.30s. Additionally, Duckworth and Seligman (2005) report that academic achievement is influenced more by student conscientiousness or self-discipline than by cognitive capabilities as measured by IQ.
**Adaptability/Flexibility**

The world of work is changing at an ever increasing pace, so employers are actively seeking out graduates who can cope with this change – i.e. graduates who are adaptable, enterprising, resourceful and ready to embrace new ideas.

In the global technological age, young people need to work with and learn from diverse groups, be flexible in a variety of professional and social settings and adaptable to changing circumstances.

**Leadership**

Employers increasingly report that leadership skills are more highly valued than academic achievement. Research shows that high-school leaders are more likely to occupy managerial occupations as adults, and leadership skills command a higher wage premium within managerial occupations than in other jobs. These results suggest that leadership skills have a component that is determined before high school entry, as well as a component that is fostered by occupying leadership positions during high school. The intensive recent efforts of many parents, schools and businesses to involve students and employees in leadership-development activities might therefore yield significant economic returns (Kuhn, 2003). The need for organisations to have effective leaders is indisputable; however, the definition of leadership is shifting. Jim Collins, who, has spent twenty years focusing on leadership and studying how some companies achieve superlative performance, found that successful leaders do not fit the traditional model of the ‘charismatic hero’. Rather they are individuals that blend personal humility with intense professional will and enormous ambition, not for themselves but for the organisation as a whole (2001).

**Ethics**

When confidence in business is undermined and individuals distrust one another, it is today more essential than ever that businesses restore their relations with customers and employees by stepping up to the ethical plate. In the book ‘Five Minds for the Future’, Howard Gardner talks about the competencies young people need to have in the 21st century and going forward. He emphasizes the importance of cultivating ethical minds, if individuals, businesses and society are to thrive. As young people go into business today, the temptation to skirt ethics is mounting, for we live in a time of intense pressure, in which individuals and organisations alike are pushed to cut corners, pursue their own interests, and forget about the effects of their behaviour on others. In business, it is easy to wander off the ethical path, because professional standards are a vocational option, not part of the territory. Then the real test of an individual’s — or a company’s — ethical fibre is what happens when there are potent pressures (2006). Therefore, it is important to develop students’ sense of integrity and cultivate their ethical compass to help them navigate through and prepare for the numerous dilemmas they will face in the working environment.

**4.4. Metacognition**

Learning how to learn, or “metacognition”, refers to a student’s ability to determine how to approach a problem or task, monitor his or her own comprehension, and evaluate progress toward completion (Landine and Stewart, 1998; Vrugt and Oort, 2008). It underpins all the dimensions of knowledge and skills mentioned above. David Conley ties metacognition directly to college readiness and uses the term to encompass many of the other competencies (2008). Learning how to learn broadly includes related competencies, such as self-regulation, which has been shown to predict achievement, attainment, and workforce success. There has been general consensus among CCR, DeSeCo and EU reference frameworks about the importance of metacognition for future success. As Alvin Toffler said, the illiterate of the 21st century won’t be those who cannot read and write but
those who cannot learn, unlearn and relearn. Therefore, it is vital that schools develop students into lifelong learners that are constantly seeking new knowledge.

CONCLUSION

There is ample evidence all around us of the many changes the 21st century has brought to our lives. We live in a more competitive, yet more interdependent world. The rapid increase in the rate at which technological change is occurring around the globe creates a world that is increasingly volatile, uncertain, complex, ambiguous (VUCA) and thus hard to predict (OECD, 2013). Such an unpredictable context requires an increased capability of humans to engage with complex challenges and agility to adapt to new situations, along with a diverse set of individual competencies. An increased number of occupations in the future will involve complex problem solving and creative thinking and require complex social interactions. Facing the challenges of the 21st century requires deliberate effort to cultivate in students these skills and competencies to respond to the needs of the labour market. One of the questions education systems will need to debate in order to prepare students for the future, is whether they should consider removal of obsolete topics to make room for new, relevant and interdisciplinary areas of knowledge combined with increased focus on teaching higher-order thinking, social and emotional skills and metacognition. Cognitive skills matter, but higher-order thinking skills, social and emotional skills and metacognition are just as important and therefore all of them need to be fostered for individuals and societies to prosper. Without proper investment in essential knowledge, skills and competencies, people languish on the margins of society, technological progress does not translate into economic growth, and countries can no longer compete in an increasingly global society. The right set of skills and competencies has become the global currency of the 21st century and advanced economies will succeed on the strength and quality of their human capital. Therefore, relevant education and workforce training must be seen as a vital economic priority.
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