The Future of Learning: New Ways to Learn New Skills for Future Jobs
Results from an online expert consultation

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The Europe 2020 strategy acknowledges that a fundamental transformation of education and training is needed to address the new skills and competences required if Europe is to remain competitive, overcome the current economic crisis and grasp new opportunities. However, to determine how education and training policy can adequately prepare learners for life in the future society, there is a need to envisage what competences will be relevant and how these will be acquired in 2020-2030.

To contribute to this vision-building process on ways of addressing emerging competence needs, JRC-IPTS[1] in collaboration with DG Education and Culture launched a foresight study on "The Future of Learning: New Ways to Learn New Skills for Future Jobs", in 2009. This study continues and extends work done in 2006-2008 on "Future Learning Spaces" (Punie et al., 2006, Punie & Ala-Mutka, 2007, Miller et al., 2008). It is made up of different modules which will be completed during 2010 and 2011. The modules will include a series of stakeholder consultations, involving different target groups ranging from policy makers, and scientists to educators and learners.

A consortium, led by TNO of the Netherlands with partners at the Open University of the Netherlands and Atticmedia UK, was commissioned to carry out a first series of expert consultation. These comprised a targeted vision building process employing the Group Concept Mapping methodology with a view to mapping future changes (cf. Stoyanov et al., 2010) and a series of online and face-to-face stakeholder consultations.

This report presents and discusses the findings of the online stakeholder consultations. It synthesizes the insights collected and arranges the findings according to emerging themes into a range of nine future scenarios.

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[1] The Institute for Prospective Technological Studies (IPTS) is one of the 7 research institutes that make up the European Commission's Joint Research Centre (JRC).

Emma (16): Improving school education

62% of experts think that, by 2025, standardised degrees and testing procedures will not have disappeared (only 14% subscribe to this assumption).

78% maintain that, by 2025, schools will have implemented personalised learning plans that take into account individual needs and preferences (5% contest).

Bruno (14): Combating early school leaving

Future strategies to fight early school leaving include:

Personalising school education to better meet individual needs and interests (78% approve; 11% disapprove)

Opening up educational institutions to society; embedding learning in the community; integrated work experiences (81% in favour; 7% oppose).

Chanta (8): Promoting inclusion

71% think that, in the future, multicultural classrooms will become the norm, thus requiring new strategies for teaching and learning (10% disbelieve).

74% highlight that, to become inclusive, education needs political leadership and greater openness and flexibility amongst educators (16% disagree).

Ingrid (32): Re-skilling workers with low qualifications

Only 56% think that, by 2025, informal learning experiences will have been recognised as a valuable asset for a new job (14% contest this supposition).

84% believe that Ingrid should aspire to upgrading her (formal) qualifications, for example by following a university course (only 5% do not favour this option).

Martina (59): Re-qualifying for a new job later in life

78% think that an increasing number of today's jobs will become obsolete and an increasing number of totally new jobs will be created (only 3% disagree).

Only 42% believe that practical skills training without degrees or qualifications is a viable re-skilling option (23% reject this idea).

Sven (42): Re-entering the labour market

76% believe that it will be common for citizens to change their professional profiles completely, even repeatedly, during their lives (11% oppose).

87% point out that people will need to become increasingly responsible for their own qualifications (3% disagree).

86% argue that skills and competences obtained in non-formal ways need to be better recognised and accepted as formal qualification criteria (6% contest).

Joshua (23): Transition from higher education to the labour market

87% believe that it will be normal that people will need to supplement their official qualifications with extra on the job training (2% disagree).

67% argue that more attention should be paid to general competences and transversal skills, because special skills are quickly outdated (17% oppose).

Slavi (55): Professional development and up-skilling

87% expect that, in the future, an open exchange between older and younger workers will become important (4% disagree).

70% suggest that, to improve team management, a collaborative training exercise which identifies the optimal interaction mode is a viable option (11% disagree).

Frank (75): Teachers' roles and training strategies

71% envisage that teachers will be guides, mentors, friends and partners in self-regulated, personalised and collaborative learning processes (13% oppose).

86% doubt that, in 2025, online resources and digital tools will be so powerful as learning sources that teachers are no longer needed (only 4% agree).

83% believe that teacher networks fostering the exchange of good practice will become an important source for pedagogical innovation (2% disagree).

Figure 1: Selection of Key Message from the Persona Consultation

This report synthesizes the findings of a series of four online consultations which were conducted as part of the study "The Future of Learning: New Ways to Learn New Skills for Future Jobs". The aim of this foresight activity was to develop visions and scenarios on the ways in which people acquire, retain and update the necessary competences for successful and prosperous lives in a fast changing world, with a view towards addressing, in particular, emerging competence needs and ways to increase individual employment opportunities. For the consultations, nine different "personas" were created as illustrations of future challenges to Lifelong Learning (Figure 1). The consultations each involved between 90 and 150 experts and took place from April to June 2010. The following main trends and key messages emerged.

Formal Education and Training in 2020-2030

Future School Education: In 2025, schools will remain the main providers of learning opportunities for the young generation. The existing, physical and formal structures of school education, including standardised degrees and testing procedures, are expected to remain intact. However, schools will have changed significantly with respect to pedagogical strategies. On the one hand, learning and teaching processes will have become more flexible in addressing and implementing individual needs and preferences. On the other hand, schools as institutions will have started to integrate external learning resources and practical learning opportunities. Technology is considered to be a facilitator for both of these strands, driving change.

Teachers and Trainers: Personalised learning strategies and increased institutional flexibility, transparency and openness will go hand in hand with a change in teaching practice. There is strong consensus among experts that the teacher role is changing and in the future teacher will be mentors and guides, while learning processes will become self-regulated, personalised and collaborative. However, it is underlined that teachers will actively engage in learning processes and will remain vital actors. They will not be replaced by ICT, nor will they become external observers or coordinators of the learning process.

Early School Leaving: Experts believe that early school leaving can most effectively be prevented by following personalised learning strategies and integrating real life experiences in school education. For those who do drop out, there will be more learning opportunities than today, possibly supported by technological innovation and by mechanisms supporting the recognition of informally acquired skills.

Inclusion and social intergration of migrant children: On the whole, experts are optimistic as concerns the capacity of school education to integrate migrant children, to implement multicultural learning and teaching strategies and to better assist migrant children in the acquisition of the language of the host country. Technology is seen as a key factor in facilitating language acquisition and helping children develop their identity at the crossroads of two languages and cultures.

Future Training Strategies for Employment and Career Development

Entering the labour market: Experts coincide that, in the future, the current gap between formally acquired skills and competences and labour market needs will not disappear – on the contrary, it will widen. However, they expect that both education and training institutions and the labour market will have started reacting to the increasing discrepancies. Education and training institutions will have to enter into dialogue with industry and adapt curricula and syllabi accordingly, and the labour market will consider implementing its own testing and

training schemes. However, given the increasing dynamics of international markets, neither strategy will manage to completely close the gap.

Re-entering the labour market: Experts believe that, in the future more and more often people will want to (or need to) enter job fields without possessing relevant formal qualifications. They emphasize that, to respond to this trend, informally acquired skills and non-professional experiences will have to be recognised. While formal qualifications will remain important, practical skills training, whether or not connected to a degree, will be more important to prepare people for a entering into a new job field.

Re-skilling those who have low qualifications: Experts agree that people with low qualifications will continue to face difficulties in finding and maintaining employment. While attaining formal qualifications will remain vital for grasping new employment opportunities, informally acquired skills will be better recognised and mechanisms will be put in place that will allow people to obtain formal recognition for their professional expertise.

Re-skilling later in life: Experts expect that, in the future, all European citizens, including those with high skills, will have to face up to the fact that their expertise could become obsolete and that they might have to start a completely new career late in their professional lives. It is similarly uncontroversial that, in reaction to the increased flexibility of industry and labour market, there will be a variety of opportunities for re-skilling and changing professional profiles. However, opinions diverge on whether practical training alone, without formal qualifications, will be a viable option. Experts are equally divided on the question of whether older workers will face difficulties in re-qualifying for a new job, although a very high minority objects to this supposition.

Career development and professional relationships: What stands out from the expert feedback is the strong belief and expectation that, in the future, professional relationships will change: hierarchies will flatten, an open approach between older and younger workers will prevail and training needs will be openly and collaboratively addressed. In parallel to this process, privileges and benefits currently associated with seniority and experience will be challenged. Competences will become a more important criterion for promotion than seniority.

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1. INTRODUCTION

We are living in an era of accelerating change, not only as regards technology development, but also on the economic and social level, and with respect to the ensuing demands on European citizens. In the future, labour markets and job profiles will change more frequently, forcing people to continuously adapt and flexibly respond to new requirements. At the same time, we are witnessing profound changes on the social and demographic level of European societies, which pose additional challenges for social cohesion and for the sustainability of European social systems, requiring policy makers to take measures to ensure that all citizens can actively participate in society. Furthermore, to remain competitive and innovative in a globalised world with changing power structures, Europe will have to intensify its efforts in developing the competences and exploiting the creative potential of all its citizens throughout their lives.

The Europe 2020 strategy acknowledges that, to remain competitive, overcome the current economic crisis and grasp new opportunities, Europe has to concentrate on smart, sustainable and inclusive growth. It has to develop a resource efficient, green and competitive economy, based on knowledge and innovation, with a high level of employment fostering economic, social and territorial cohesion. One key to achieving these overall goals is developing and investing in citizens' skills and competences. Consequently, one of the five targets for measuring the success of the Europe 2020 strategy is the modernisation of European Education and Training systems and institutions by reducing early school leaving and increasing tertiary education attainment. Also to meet other targets, such as increasing the overall employment rate and the share of women, older workers and migrants in the work force, and to reduce poverty, it is of paramount importance to develop citizens' occupational skills and relevant competences. The importance of competence development, in all areas of life, for all job profiles and over the whole course of a lifetime, is emphasized by the fact that six of the seven flagship initiatives, in one way or another, address the importance of appropriate and adequate skills training and competence development.

However, if we are living in an era of accelerating change, how do we know what to prepare people for? How can we make people today fit for a future that is unknown to all of us, but that we expect to be significantly different from today? How can we implement mechanisms today that will enable the learners of the future to acquire skills for jobs that do not even exist yet?

Thus, to determine how education and training policy can adequately prepare learners for life in the future society, there is a need to envisage what competences will be relevant and how these will be acquired in 2020-2030. To contribute to this vision-building, in 2009, JRC-IPTS in collaboration with DG Education and Culture launched a foresight study on "The Future of Learning: New Ways to Learn New Skills for Future Jobs" (http://is.jrc.ec.europa.eu/pages/EAP/ForCiel.html). This study aims to provide evidence on how competences and occupational skills will and can be acquired in the future, in order to support priority setting for education, training and skilling policies. It does not intend to correctly predict or model the future. Rather, it employs a number and variety of stakeholder consultation exercises to come up with imaginative visions and scenarios of the future of learning, which provide valuable insights into current trends and their possible development in the future.

A consortium led by TNO of the Netherlands, with partners at the Open University of the Netherlands and Atticmedia, UK was commissioned to carry out a first series of expert consultations. These comprised a targeted vision building process employing the Group Concept Mapping methodology with the objective to map future changes (cf. Stoyanov et al., 2010) and a series of online and face-to-face stakeholder consultations.

This report presents and discusses the findings of the online stakeholder consultations. It synthesizes the insights collected and arranges the findings according to emerging themes in nine future learning scenarios. In the following chapters, after a brief description of the methodology employed and an explanation of the persona development, these nine scenarios will be presented and analysed. Finally, some common traits will be emphasized, leading to the formulation of conclusions and recommendations for policy action.

2. METHODOLOGY

This research project employs a foresight methodology, based on the consultation of experts, with the aim to develop imaginative visions and scenarios of the future of learning. In a structured approach, focus groups, open consultation and discussion, online surveys and foresight workshops are interwoven, to ensure that insights and findings are thoroughly scrutinised and validated.

Foresight is a systematic, participatory, future-intelligence-gathering and medium-to-long-term vision-building process which aims to support present-day decisions and mobilise joint actions.[2] Future-oriented thinking is vital for any forward planning or policy activity to be able to meet future challenges proactively. Foresight enhances such thinking by gathering anticipatory intelligence from a wide range of knowledge sources in a systematic way and linking it to today's decision making.[3]

The foresight methodology employed in this study is not used to predict the future, but rather to elaborate and understand different, plausible futures. The aim of this particular foresight activity is to develop visions and scenarios on the ways in which people will acquire, retain and update the necessary competences for successful and prosperous lives in a fast changing world, with a view to addressing, in particular, emerging competence needs and ways to increase individual employment opportunities.

The scenarios, as they are conceptually employed in the research, are "stories" illustrating visions of a possible future or aspects of a possible future, as manifested in an archetypical situation. Scenarios are not predictions of the future but more like simulations of some possible futures.[4] They are used both as an exploratory method, enquiring into possible future developments and, at the same time, as a tool for decision-making, which aims to highlight the discontinuities from the present and to reveal the choices available and their potential consequences.

In this research project, it was decided to follow an open approach to expert consultation and to make extensive use of the internet as a medium for knowledge exchange and networking. In particular, groups were set up on web 2.0 platforms, such as LinkedIn,[5] Facebook[6] and YouTube[7] to set up networks of experts, initiate discussions and consultations and disseminate results. While online and face-to-face discussion contributed to the scenario development and refinement, the core work of the scenario development was implemented using a series of targeted surveys.

All the surveys and the other expert input provided online in the different stages of the project can be found in Annex I. The results of the online consultations, together with a transcript of the complete qualitative input can be found in Annex II. The methodological framework included the following steps:

Phase 1: Preparation and Conceptualisation

In a first phase, a network of experts and stakeholders interested in the research was set up on different online platforms: i.e. on LinkedIn, Facebook and YouTube. The LinkedIn group on "The Future of Learning" with its over 550 members proved by far to be the most valuable resource for expert input. In parallel to the setting up of this network of experts, a literature

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[2] http://forlearn.jrc.ec.europa.eu/index.htm.
[3] http://forlearn.jrc.ec.europa.eu/guide/0_home/index.htm.
[4] http://forlearn.jrc.ec.europa.eu/guide/4_methodology/meth_scenario.htm.
[5] http://www.linkedin.com/groups?mostPopular=&gid=2266966.
[6] http://www.facebook.com/group.php?gid=176371588344.
[7] http://www.youtube.com/user/FutureofLearning2030.

review was undertaken to identify the most salient changes and challenges for Europe over the course of the next 10 to 20 years which will affect, in one way or another, education and training or employment. Based on this literature review and on consultations with European Commission staff, nine characters, or 'personas', were developed, each representing a prototypical situation which describes a challenge or problem for education and employment policies in the future.

Phase 2: Experimentation

In the course of setting up the groups on LinkedIn and Facebook, attempts were made to initiate discussions on the topics relevant for the future of learning and thus collect expert input on dedicated discussion threats. While the discussions were interesting, it was felt that the structure available on the platforms did not allow for more targeted discussion of the personas, leading to a scenario development. To develop more vivid representations, comics were developed, visualising the problem or challenge represented by the persona. These were posted on the project page (www.futureoflearning.eu) and members of the LinkedIn and Facebook groups were provided with the corresponding links via "announcements" published in these groups. Starting in March 2010, a new persona description was made available every week and announcements were posted on LinkedIn and Facebook: on 19 March ("Frank": the future role of teachers), on 26 March ("Emma": institutional change) and on 9 April ("Chanta": inclusion).

Initially, it had been planned that the scenario development would rely entirely on the open persona discussions on the project page. However, after three personas had been launched the project team came to the conclusion that this approach was still not targeted enough to support the development of scenarios. While expert input was interesting and insightful, communication was one-directional. Only in a very few cases did experts respond to each others' posts, so it was impossible for the project team to detect agreement or see how a thought was developed and refined by the input of several experts. At the same time, each respondent tended to pick out an aspect that had not been mentioned before, so that many different aspects were highlighted, without, however, becoming connected or weighted.

Moreover, the approach followed, as an open discussion, does not invite the participation of a vast number of people. Consequently each discussion group consisted of less than 20 people. Had there been an intensive exchange of opinions between these people, this open discussion could have replicated insights gained, for example, at expert workshops and could have proven a valuable source of input for a foresight exercise. Given the lack of interaction between participants, the scenario development would have had to be based on an ex-post structuring of the insights provided, for which, from a scientific point of view, far more input would have been needed.

The project team came to the conclusion that a completely open discussion proved difficult to handle and to use for the scenario development. It was therefore decided to employ a more structured approach, using a survey format, while maintaining, as far as possible, the open character of consultations and following a qualitative rather than a quantitative approach

Phase 3: Piloting

In the previous stage of consultations, expert insights had already been collected on three different personas and corresponding themes. To consolidate and validate these findings, three statements per persona were selected among those provided by the experts in the initial open online consultation. A survey was set up, asking respondents to express their agreement or disagreement to each statement (from 1=strongly disagree to 5=strongly agree) and encouraging them, for each statement, to justify and explain their agreement or disagreement. Again, announcements were published on LinkedIn and Facebook encouraging group

members to contribute to the survey. The survey was launched on 20 April and closed on 20 June, generating responses from 111 stakeholders.

Within a day, more than 40 stakeholders had contributed to this first survey, indicating that this approach was fruitful and far more promising, from a scientific point of view, than the open consultation previously experimented with. The research team therefore decided to follow this approach for developing scenarios for the remaining six personas.

However, reflecting on the survey set-up and the input received, several modifications were conceived necessary. First of all, it was felt that the statements used as a basis for consultation should be more carefully formulated and selected. While the pilot survey succeeded in validating the findings collected in the previous rounds of open consultations, it was felt that the whole sphere of problems at stake had not been fully covered. Secondly, while the aim had been attained to collect enough (disconnected) qualitative input to justify any classification or clustering of input, the research team was overwhelmed by the sheer quantity of input and found it very difficult to handle the amount of unstructured qualitative data. It was therefore decided, for subsequent surveys, to increase the number of statements for rating and to completely discard open questions inviting free text input, while allowing for qualitative feedback to be supplied on a voluntary basis.

Thirdly, the pilot survey had followed a thematic, rather than a persona approach, in an attempt not to overburden the participant with lengthy persona descriptions. However, to re-focus the consultation on the scenario development and to show how the different aspects are thematically linked, when considered from the perspective of a person with certain common employment and training needs, it was decided to re-focus the consultations on persona descriptions.

Phase 4: Implementation

Based on the reflection of the pilot survey, a series of three surveys, following a common approach, was developed, each consulting stakeholders on three personas grouped according to a common theme. Whereas the pilot survey employed a mixture of open and closed questions, these surveys were conceptualised in a quantitative way by asking respondents how far they agree or disagree with certain key statements, which were structured and arranged by subtopics. In the majority of cases, for each persona, at least two statements addressed general trends, such as labour market developments; at least two statements assessed the consequences of these trends for the particular persona; and a further set of two to three statements encouraged stakeholders to envisage future solutions to facilitate the persona's competence development and employability.

Initially, it had been planned to use this format only for the six personas which had not been addressed in the pilot survey. However, to ensure a methodologically sound and uniform approach for all nine scenarios, and given that the pilot survey had not followed a persona approach, it was decided to repeat the consultation on the first three personas using the common survey format.

The first survey with the new format (i.e. the second survey in total) addressed issues of continuous professional development, as exemplified by Sven (re-integration into the labour market), Martina (re-skilling) and Slavi (up-skilling) was launched on 5 May, again by publishing the link on LinkedIn and Facebook and contacting stakeholders by e-mail. Within less than a week, more than 80 experts had contributed to the survey and feedback by participants confirmed the soundness of the new format employed. The third survey, launched on 17 May, targeted particular challenges in the future, such as early school leaving (Bruno), transition from higher education to the workplace (Joshua) and enhancing the employability of people with low qualifications (Ingrid). The fourth and final format, complementing the

findings of the pilot survey, launched on 4 June, addressed the future role of teachers (Frank), personalisation strategies for formal education (Emma) and inclusion (Chanta).

All surveys were closed on 20 June. The pilot survey generated 111 responses in total; the first survey in the common format, i.e. online consultation part II, received 151 responses from stakeholders, part III generated 101 and part IV 94 responses.

Participation in the consultations was not restricted; all four surveys were openly accessible online. Invitations to participate were sent out to all members of the Future of Learning groups on LinkedIn and Facebook, who were encouraged to widely distribute the invitation to other experts who might be interested in the research. Furthermore, existing networks were used to invite researchers, educators and policy makers all over Europe. Based on the information voluntarily provided by about half of the participants, respondents' profiles range from academics, researchers, consultants and practitioners, most of them with expertise in education and training, pedagogy, technology, foresight and/or innovation, to educational policymakers and advisors. The majority of respondents come from Europe, covering at least 15 different European countries.

Phase 4: Validation

To validate initial findings from the online stakeholder discussion and also from other modules of the research project, a workshop with 16 external experts and four European Commission members of staff, involved in the research, and six further project members was organised and it took place in Amsterdam on 15-16 May 2010. Furthermore, initial results were discussed in a workshop with European Commission staff from different Directorate Generals at a project workshop on 27 May, 2010, in Brussels.

Reflection

The overall approach was quite successful and response rates to all surveys – including the pilot survey – were high for a foresight exercise. The establishment of online groups on platforms such as LinkedIn and Facebook was key to raising participation rates. However, these platforms, while allowing for the establishment of loose networks of contacts, proved less suitable for online discussion and consultation in an open format. The traditional survey approach to stakeholder consultation was conceived as being more useful, by the researchers and also by the participants themselves.

To further consolidate findings and to expand the methodological approach, it could be considered to subject the findings of the three main consultation rounds, as they are developed and discussed in this report, again to stakeholder consultation.

3. SCENARIO DEVELOPMENT

The online stakeholder consultations and the ensuing scenarios are conditioned by the methodological framework, which is based on nine persona descriptions, i.e. nine prototypical biographies which illustrate envisaged learning and training needs in Europe in 2025. These persona descriptions have been developed on the basis of a systematic review of existing foresight studies on the future of learning combined with discussions with policy makers.

The personas were conceptualised according to three key research questions, namely:

1. How can **formal education and training**, and in particular school education, prepare students for future challenges and job requirements and implement learning and teaching strategies that will enable all students to optimally develop their talents and to actively participate in society?

2. How can citizens be enabled to respond to disruptive changes to their professional careers, by **re-qualifying** for new job profiles and emerging employment opportunities, thus improving the overall **match of skills supply and demand**?

3. How can people continue to **develop and update** their skills and competences over the course of a lifetime, not only in view of their personal career development, but also as a contribution to **driving innovation** and progress?

These three horizontal lines of thought were complemented by several overlapping vertical thematic layers, relevant for grasping a complete picture of the future of learning. It was considered important, in particular, to address the following aspects, in one way or another, in the scenario development:

- *Life stages,* differentiating between initial training and job preparation; professional development; and retaining and developing the skills of older people, enabling them to stay employed for as long as possible;

- *Qualification levels,* differentiating between those who are highly qualified and extremely specialised, those who have a good level of skills, and those who have low qualifications;

- *Socio-economic backgrounds,* considering in particular population groups who will find it more difficult to find employment and actively participate in society, such as immigrants; people who have been out of work for a long time, for example to look after children or care for parents; older workers; disabled people; economically disadvantaged groups and those with low qualifications.

- *Learning strategies*, differentiating between formal education and training courses that lead to a recognized and certified degree or qualification; non-formal learning strategies, i.e. structured and targeted strategies to obtain knowledge and skills, without, however, (necessarily) leading to a degree; and informal learning that takes place in an unstructured and unguided way, often as a by-product of other activities and interactions.

- *Current challenges,* which will continue to be relevant for education, training and employment in the future. These include early school leaving, tertiary education attainment, integration of migrants, increasing employment.

For each of the key questions, three scenarios were developed, on the basis of variations in these additional themes (see Figure 2). The nine learning situations were shaped along two different axes, corresponding to:

- *Learning situations*, where we distinguish between (1) initial learning and training, i.e. students under the age of 25; (2) competence development with a view to taking up a new job or re-qualifying for a different career and (3) professional development strategies to develop a career, improve performance or adapt to the changing requirements within a particular work field.

- *Learning strategies*, where we differentiate between (A) formal education and training courses that lead to a recognized and certified degree or qualification; (B) non-formal learning strategies, i.e. structured and targeted strategies to obtain knowledge and skills, without, however, (necessarily) leading to a degree; and (C) informal learning, that takes place in an unstructured and unguided way, often as a by-product of other activities and interactions.

Each row in this matrix broadly reflects one of the key questions and each column reflects the focus of the envisaged learning strategy.

Figure 2: Persona Matrix

It has to be noted that there are important cross-references and relations between the different personas and the themes they illustrate. For example, the teacher persona Frank exemplifies professional development strategies for one professional group, but, at the same time, illustrates challenges for future school education. Similarly, the persona of Joshua crosses all three horizontal themes, by questioning the quality of tertiary education, by addressing shortcomings in matching the demand and supply of skills and by posing the question of how he can improve and develop his skills. Also, none of the scenarios exclusively relies on either formal or informal or non-formal learning strategies. Rather the two dimensional matrix offers a conceptual framework for modification and variation, which indicates the variety and scope of issues that are relevant for the scenario development.

4. RESULTS OF THE STAKEHOLDER CONSULTATION

4.1 EMMA: PERSONALISING SCHOOL EDUCATION

EMMA	Formal	Non-formal	Informal
Schools	X	X	X
Qualifying			
Developing			

Persona description

Emma is 16 and a good student who generally enjoys learning. However, school bores her. There are so many things she wants to know, to say and to do and no room to express herself. She can't wait to get to university where she hopes to be finally treated like an adult.

4.1.1 Results of the online consultation (survey IV)
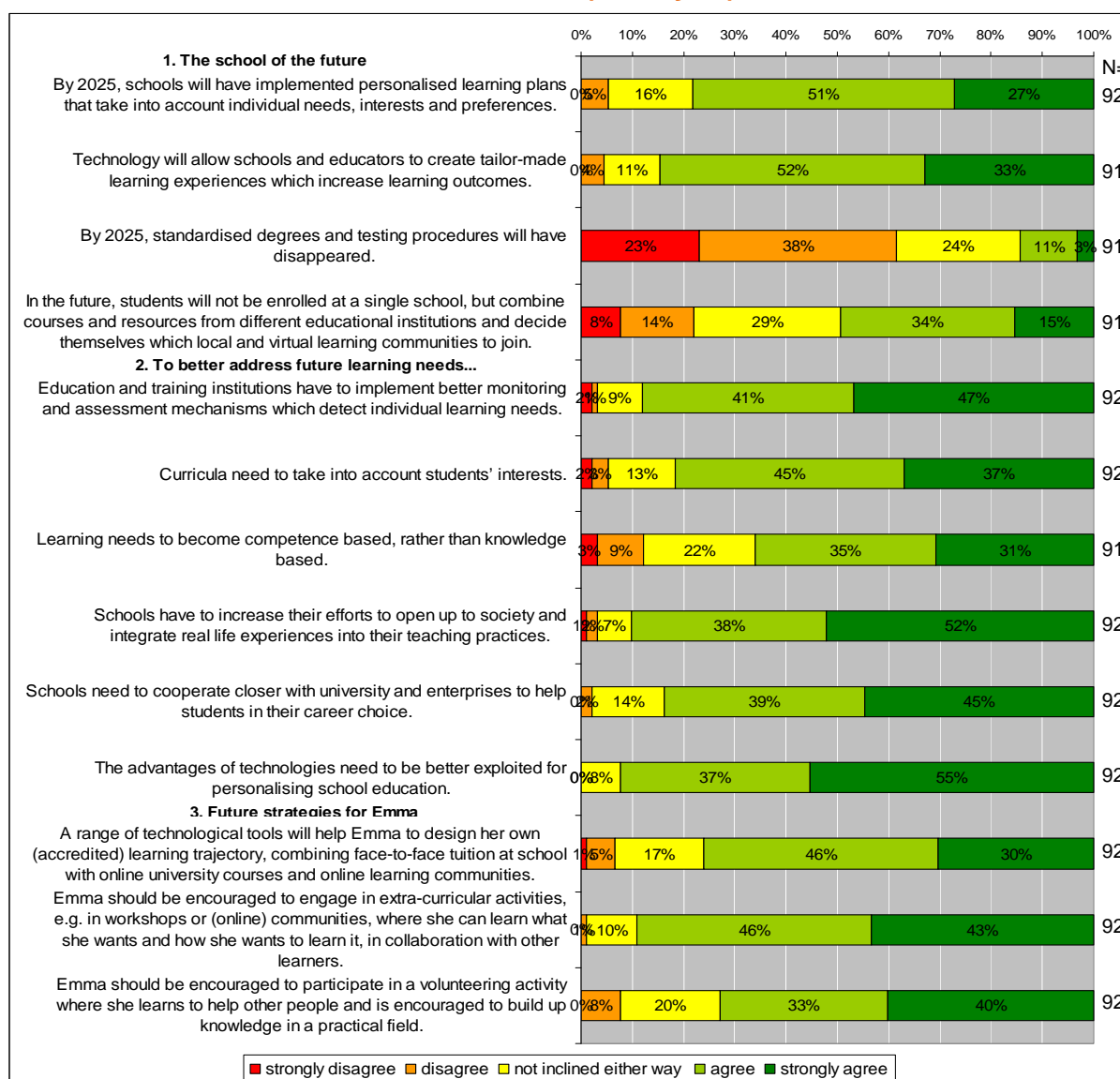
Figure 3: Results of online consultation (part IV) on the persona of Emma (in %, 91-92 responses)

4.1.2 Results of the pilot online consultation (survey I)
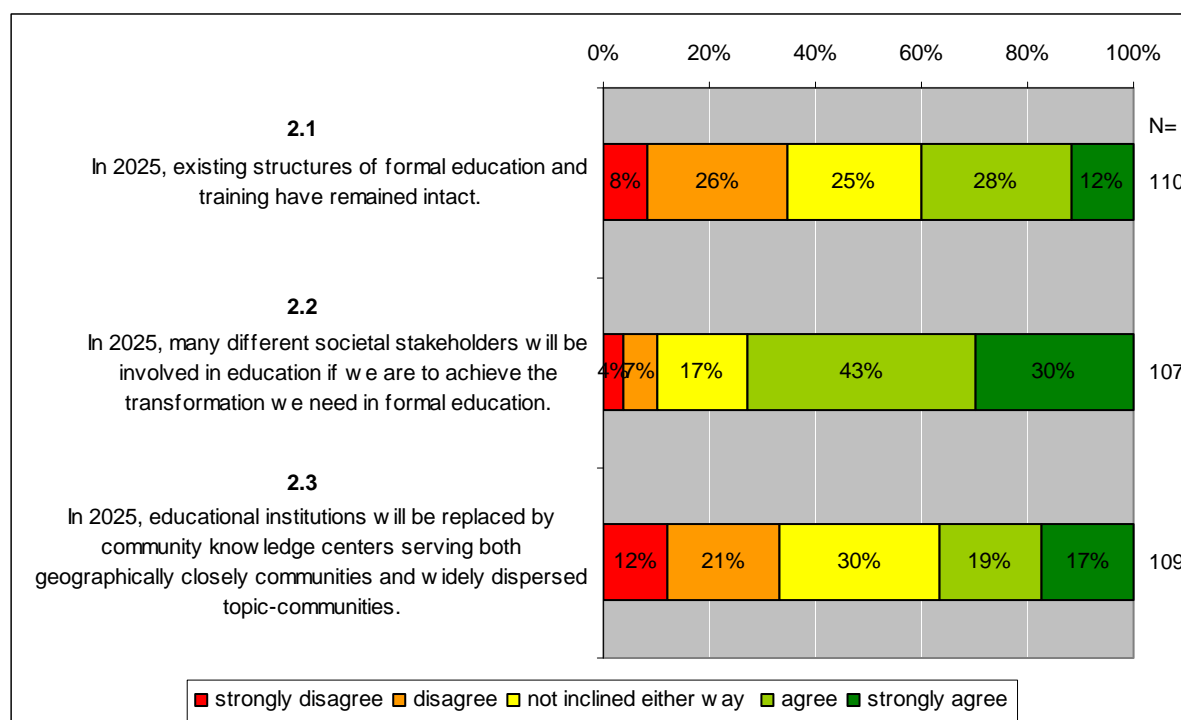
Figure 4: Results of online consultation (part I) on institutional change (in %, 107-110 responses)

4.1.3 Key Questions and Themes

The persona of Emma is representative of a normal teenager, who is talented and genuinely interested in learning, but who loses interest in what is offered by schools. The main question underlying the conception of Emma was: If we abstract from individual problems adolescents have at high school and assume that we have a perfect student who could easily perform well at school, would it not still be normal that, with increasing independence around the age of 15-18, this student loses interest in a standardised learning pathway that does not allow her to express her individuality? If that is the case, how can the school of the future respond to individual preferences and interests? How can it ensure that the creative potential of its students is fully developed? How can it, at the same time, make learning efficient and effective?

Thus, the main theme for the scenario development was personalisation and the main question: How can schools implement personalised learning strategies?

4.1.4 Key Findings

According to the experts consulted, personalisation is not a distant dream. Quite the contrary: 78% believe that by 2025, schools will have implemented personalised learning plans that take into account individual needs, interests and preferences. An even higher share of 85% believe that technology will allow schools and educators to create tailor-made learning experiences which increase learning outcomes. Hence, according to expert opinion, technology can facilitate the implementation of personalised learning strategies in school education.

However, there is no general consensus on the changes needed on the broader institutional and policy level. A high proportion of 62% of the experts consider it unlikely that standardised degrees and testing procedures will disappear. Also, opinions are divided on how far institutional barriers will be overcome. 49% of respondents consider it likely that, in the future, students will not enroll at a single school, but will combine courses and resources from

different educational institutions and decide themselves which local and virtual learning communities to join. However, a significant 22% reject this supposition.

There is more unity as concerns the concrete policy measures that should be taken to promote personalisation. 88% of respondents think that education and training institutions have to implement better monitoring and assessment mechanisms which detect individual learning needs; 82% advocate that curricula need to take into account students' interests; and 66% maintain that learning needs to become competence based, rather than knowledge based.

There is a high agreement that on the local level, a lot can be done to foster change. 84% argue that schools need to cooperate closer with university and enterprises to help students in their career choice and 90% of respondents assert that schools have to increase their efforts to open up to society and integrate real life experiences into their teaching practices.

The importance of integrating real life experiences into school education and of opening up schools to society is also underlined by the high agreement of experts on the idea, that extra-curricular activities (89%) and volunteering (73%) are ways of keeping Emma interested in learning and responding to her interests and preferences.

While technologies are considered a key tool for personalisation, a vast majority of experts (92%) insist that the advantages of technologies need to be better exploited for personalising school education. 76% envisage that in 2025 there will be a range of technological tools available that will help Emma to design her own learning trajectory, combining face-to-face tuition at school with online university courses and online learning communities.

In conclusion, the scenario that emerges is that, in 2025, schools will remain the main provider of learning opportunities for the young generation. As confirmed by the first (pilot) survey on the theme of institutional change, it is unlikely that, by 2025, schools will have been replaced by virtual networks or local community centres. Thus, the existing, physical and formal structures of school education will have remained intact. In particular, standardised degrees and testing procedures are not expected to disappear. However, at the same time, schools will have changed significantly with respect to pedagogical strategies. On the one hand, learning and teaching processes will have become more flexible in addressing and implementing individual needs and preferences. On the other hand, schools as institutions will have started to integrate external learning resources and practical learning opportunities. Technology is considered to be a facilitator for both of these means of driving change.

4.2 BRUNO: PREVENTING EARLY SCHOOL LEAVING

BRUNO	Formal	Non-formal	Informal
Schools	X	**X**	X
Qualifying			
Developing			

Persona description

Bruno is 14 years old and really not interested in school anymore. He spends his days hanging around with friends and playing computer games instead of going to school.

4.2.1 Results of the online consultation
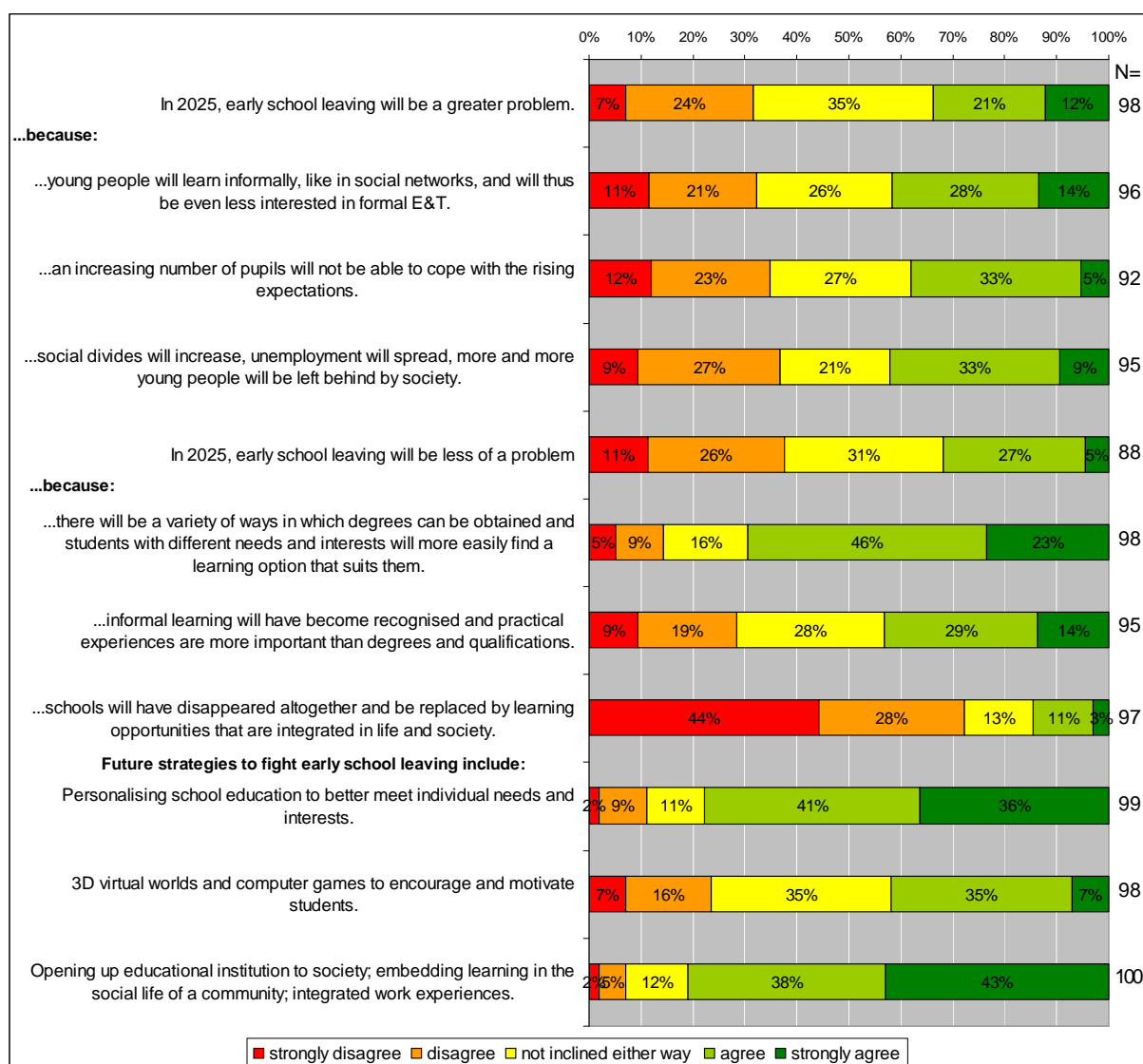
Figure 5: Results of online consultation (part III) on the persona of Bruno (in %, 88-100 responses)

4.2.2 Key questions and themes

The persona of Bruno addresses one of the key policy challenges and policy targets in Europe: reducing the school drop-out rate from the current 15% to less than 10% by 2020 (Europe 2020; European Council 2010). There is no single cause for early school leaving, and, on the individual's side, a number of detrimental factors often coincide. There are a various small-scale initiatives, including a number of projects successfully employing ICT (cf. Haché & Cullen, 2010; Cullen et al., 2009), which succeed in re-engaging youth at risk. However, on the whole, the current mechanisms currently for avoiding early school leaving, detecting disengagement early enough and re-engaging students at risk in learning activities, are not effective enough to prevent 15% of young people leaving secondary education pre-maturely without qualifications.

In a future, where many jobs will require higher qualifications than today and where all citizens will have to engage in up-skilling or re-skilling activities during their lives, the ability and propensity to learn in a lifelong learning continuum are an indispensible pre-requisite for active participation in society. Early school leavers are ill prepared for life in a knowledge-based society, not only because of their lack of qualifications, but also and in particular because they have not experienced learning as a positive and enriching endeavour, but rather as a wasted effort associated with failure and boredom.

Therefore, the scenario development for Bruno concentrated on identifying trends that might favour or hinder early school leaving in the future and on envisaging future strategies for counteracting school drop out.

4.2.3 Key findings

Experts are divided on the question of whether early school leaving will be a greater problem in 2025 or whether it will be less significant. Roughly one third of respondents think this problem will grow, one third is undecided and one third presumes that early school leaving will be less of a problem.

Experts also disagree on the assessment of potential factors that could have an impact on the phenomenon. 42% believe that young people will learn informally, like in social networks, and will thus be even less interested in formal E&T, whereas 32% oppose this statement; 38% think that an increasing number of pupils will not be able to cope with the rising expectations, while 35% disagree; and 42% expect that social divides will increase, unemployment will spread, and more and more young people will be left behind by society – while 37% consider this unlikely.

There is more consensus on the options available in the future that might contribute to reducing early school leaving. 69% of respondents believe that, in 2025, there will be a variety of ways in which degrees can be obtained and students with different needs and interests will more easily find a learning option that suits them (only 14% oppose this statement). A vast majority of 81% (with 7% opposing) believes that strategies for preventing early school leaving include opening up educational institutions to society, thus embedding learning in the social life of a community and integrating work experiences. A similarly high majority (78% with 11% opposing) maintains that personalising school education to better meet individual needs and interests will contribute to reducing the number of early school leavers.

However, experts do not expect drastic changes. Only 43% (compared to 28% opposing) envisage that informal learning will have become recognised and that practical experiences will have become more important than degrees and qualifications. A vast majority of 72% (compared to 14% opposing) is of the opinion that schools will not have disappeared altogether to be replaced by learning opportunities that are integrated in life and society. Also,

the power of 3D virtual worlds and computer games to encourage and motivate students, is recognised as being a key to fighting early school leaving by 42% of respondents, while 23% do not believe in this solution.

Thus, in conclusion, experts believe that, in the future, early school leaving can most effectively be prevented by following personalised learning strategies and integrating real life experiences in school education. These are exactly the same strategies that were highlighted in the case of Emma, i.e. for students who are not at risk of being left behind. This concurrence is interesting and important, in particular when considering that the two persona consultations were implemented in separate surveys. For those who do drop out, there will be more learning opportunities than today, possibly supported by technological innovation and by mechanisms supporting the recognition of informally acquired skills.

4.3 CHANTA: INCLUSION AND EQUITY IN SCHOOL EDUCATION

CHANTA	Formal	Non-formal	Informal
Schools		X	**X**
Qualifying			
Developing			

Persona description

Chanta is a 6 year old Cambodian girl whose family has just emigrated to France. She does not speak a word of French and feels completely lost.

Chanta

4.3.1 Results of the online consultation (survey IV)

1. Migration and cultural diversity in 2025

Since immigration is projected to increase, by 2025 most European countries will have implemented effective programs supporting integration and socio-economic inclusion. — 3% | 20% | 30% | 29% | 18% — N= 90

In 2025, it will be normal for people to change their country of residence and the younger generation will naturally grow up speaking different languages and belonging to different cultures. — 3% | 19% | 29% | 36% | 12% — 89

Cultural awareness and inter-cultural communication will become an important subject in school education. — 0% 4% | 26% | 40% | 30% — 90

By 2025, it has become normal for schools to provide support and training for pupils with insufficient language skills. — 0% 6% | 31% | 47% | 17% — 90

2. Future challenges to equity and inclusion

In the future multicultural classrooms will have become the norm, thus requiring new strategies for teaching and learning in such settings. — 3% 7% | 19% | 52% | 19% — 89

By 2025, schools will have realised what a rich learning resource students like Chanta are for their peers. — 2% | 12% | 42% | 35% | 9% — 89

In 2025, technological innovations will allow children like Chanta to continue studying their native language and culture, e.g. by attending a virtual classroom with other Cambodian French children. — 3% | 11% | 24% | 39% | 22% — 89

3. Future strategies for children like Chanta

Digital games and virtual worlds will help Chanta in the transition phase by simulating real life experiences in which she can train language, cultural and communication strategies. — 6% | 8% | 16% | 43% | 28% — 90

Learning programs combining Khmer with French, written with spoken language, pictures with words, help Chanta learn French. — 2% | 10% | 19% | 42% | 27% — 90

In 2025 language skills have become less relevant due to improved, mobile and real-time translation technologies. — 38% | 34% | 8% | 17% | 3% — 89

■ strongly disagree ■ disagree ■ not inclined either way ■ agree ■ strongly agree

Figure 6: Results of online consultation (part IV) on the persona of Chanta (in %, 89-90 responses)

23

4.3.2 Results of the pilot online consultation (survey I)

Figure 7: Results of online consultation (part I) on inclusion (in %, 108-110 responses)

4.3.3 Key questions and themes

Immigration will be an important key factor for Europe in the next 10-20 years. On the one hand, immigration can significantly contribute to employment, growth and prosperity in Europe (European Commission 2008a). On the other hand, however, the integration of a growing immigrant population remains a long-term challenge for Europe (European Commission 2009). The impact of immigration on school education in particular is significant. PISA 2006 data show that at least 10% of the school population aged 15 (within the old Member States) was either born abroad or has both parents born in another country.

There is general consensus that key factors for successful integration and social participation of immigrants in society include the need to increase efforts in formal education, addressing the specific needs of immigrant children and youth at an early stage, to empower them to become active participants in society (European Commission, 2007). At the same time, there is clear and consistent evidence that today many children of migrants have lower levels of educational attainment than their peers (European Commission 2008b; 2008c). There are many different factors accounting for their current educational disadvantage – among them, most prominently, socio-economic conditions and language barriers.

Therefore, the main questions underlying the conception of Chanta were: If we look into the future, what will have changed? Will European countries have implemented effective measures to improve educational opportunities for migrant children? What are the key mechanisms for successful integration? How will schools have changed their ways of addressing foreigners in the classroom? There is some evidence that technologies can contribute to facilitating integration (cf. Redecker et al., 2010; Kluzer et al., 2008). Will this potential have been realised? These are the kind of questions the persona of Chanta aims to address.

4.3.4 Key findings

The experts consulted are only slightly optimistic about Europe's efforts in implementing effective integration programmes for migrant families. Only 47% thinks that by 2025 most

European countries will have implemented effective programmes to support integration and socio-economic inclusion; a significant minority of 23% does not believe that effective measures will have been implemented.

While it is envisaged that people might become increasingly flexible as concerns their country of residence, experts are not persuaded that, for the overall population, geographical mobility will become the norm. Only 48% subscribe to the statement that, in 2025, it will be normal for people to change their country of residence and the younger generation will naturally grow up speaking different languages and belonging to different cultures; 22% firmly oppose. These findings are confirmed by the first pilot survey, where 74% of experts asserted that, for education to be inclusive in 2025, it needs to embrace mixed and multiple cultures.

The results of the final survey suggest that, in 2025, on the school level, important changes will have been implemented to facilitate the integration and social inclusion of migrant children. A high proportion of 71% (with only 10% opposing) maintain that multicultural classrooms will become the norm and that therefore new strategies for teaching and learning are required. As a consequence, cultural awareness and inter-cultural communication will become an important subject in school education, as emphasized by 70% of respondents (with only 4% disagreeing).

As regards language acquisition in particular, according to experts, over the next 10 to 20 years, schools will substantially improve their efforts to accommodate the needs of children from foreign origins. 63% of experts are optimistic that, by 2025, it will have become normal for schools to provide support and training for pupils with insufficient language skills (only 6% dissent). 69% think that learning programmes combining Khmer with French, written with spoken language, pictures with words, will help Chanta learn French (12% disagree).

Technology is considered an important facilitator of language acquisition and social integration. 62% of experts think that, in 2025, technological innovations will allow children like Chanta to continue studying their native language and culture, e.g. by attending a virtual classroom with other Cambodian French children (15% are sceptical). 71% foresee that digital games and virtual worlds will help Chanta in the transition phase by simulating real life experiences in which she can train language, cultural and communication strategies (13% are not persuaded). According to experts, the technological Babelfish, which provides instantaneous translations and thus renders foreign language acquisition unnecessary, is an unrealistic dream. Only 20% of experts believe that language skills will become less relevant due to improved, mobile and real-time translation technologies, while a high 72% dispute this statement.

However, for school education in general, integrating migrant children will remain a challenge and will be conceived as such. Only 44% of experts believe that, by 2025, schools will have realised what a rich learning resource students like Chanta are for their peers. Yet, only 15% contest this statement, which might indicate that it is unclear to experts what attitude schools will assume in view of increasingly multicultural classrooms.

On the whole, experts are optimistic as concerns the capacity of school education to integrate migrant children, to implement multicultural learning and teaching strategies and to better assist migrant children in the acquisition of the language of the host country. Technology is conceived as a key factor in facilitating language acquisition and helping children develop their identity at the crossroads of two languages and cultures.

4.4 INGRID: PEOPLE WITH LOW QUALIFICATIONS

INGRID	Formal	Non-formal	Informal
Schools			
Qualifying	**X**		X
Developing			

Persona description

After secondary school, Ingrid started to travel the world, financing her life by working as a bike courier. After an accident, at the age of 32, she is left with a limp and has to find some other form of income.

Results of the online consultation
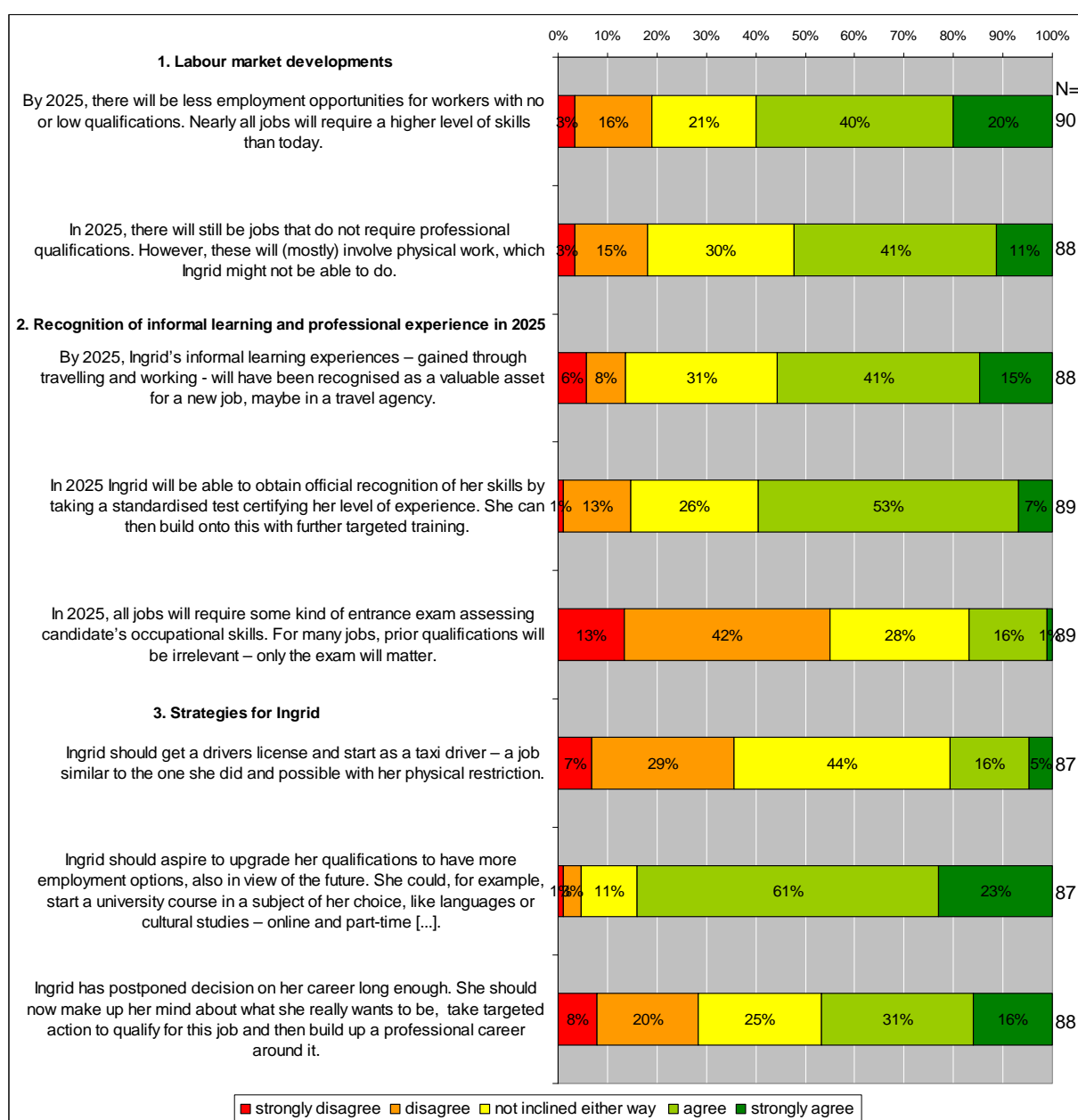
Figure 8: Results of online consultation (part III) on the persona of Ingrid (in %, 87-90 responses)

4.4.1 Key questions and themes

Currently, there is a pronounced mismatch between the skills needed by industry and the skills supplied by the labour force (Cedefop, 2008). Thus, ensuring a better match between the supply of skills and labour market demand is a key objective of the European New Skills for New Jobs policy (European Commission, 2008d). The Europe 2020 industrial policy flagship initiative underlines that to restructure industrial sectors towards future-oriented activities, skills need to be quickly redeployed to emerging high growth sectors.

According to projections, in 2020 there will be an increase in jobs requiring high qualifications and the number of jobs requiring low qualifications will decrease (Cedefop, 2008). Thus, people who have low qualifications will become even more vulnerable in the future and will face an increased need to upgrade their skills and to re-skill for new job profiles to remain in employment. At the same time, the fact that industrial sectors and labour market requirements may change more frequently in the future, might also be an opportunity for those who are not specialists in a certain field and are used to flexibly taking on employment opportunities as they arise, learning what they need to know as they go along.

The main question underlying the conception of the persona of Ingrid was therefore: How can, in the future, people who have low formal qualifications, but who have informally acquired many valuable skills, convert the need to find a job in a completely new field into an employment and career opportunity? How can they rise out of unemployment with the prospect of an economically viable, prosperous and happy future?

4.4.2 Key findings

The case of Ingrid is a difficult one, which is also reflected by the fact that expert opinion is not as pronounced in this persona consultation when compared to some of the others. In most of the questions, at least one third of respondents are undecided.

There are two exceptions, which highlight that experts agree with the overall diagnosis underlying the conception of the persona of Ingrid: 60% of experts agree that, by 2025, there will be less employment opportunities for workers with no or low qualifications and that nearly all jobs will require a higher level of skills than today, although a significant minority of 19% does not share this assessment. In any case, experts almost unanimously agree that to overcome unemployment and re-qualify for a new job, Ingrid needs to invest in formal training and get a qualification. 84% of experts think that Ingrid should aspire to upgrading her qualifications in order to have more employment options, also in view of the future, by, for example, starting a university course in a subject of her choice, online and part-time while doing some kind of provisional work. Only 5% do not subscribe to this solution.

Thus, the vast majority of experts considers formal qualifications as the key for enabling low qualified workers to enter a new job field. A slight majority furthermore believes that, in 15 years' time, Ingrid's informally acquired competences will be better recognised. 56% (with 14% contesting) believe that, by 2025, Ingrid's informal learning experiences – gained through travelling and working - will have been recognised as a valuable asset for a new job, maybe in a travel agency. 60% (with 15% disagreeing) maintain that Ingrid will be able to obtain official recognition of her skills by taking a standardised test certifying her level of experience, and then building onto this with further targeted training.

However, experts do not believe that recruitment will be based on tests which objectively assess the relevant occupational skills and competences for a given job profile, thus replacing or complementing formal qualifications. Only 17% of respondents assert that all jobs will require some kind of entrance exam assessing candidate's occupational skills and that, for many jobs, prior qualifications will be irrelevant, only the exam will matter. A majority of 55% of experts contest these statements.

The majority of experts were a bit indecisive concerning career strategies for Ingrid and leaned towards encouraging her to take up university studies. On the whole, experts tended to be rather ambitious for her. Experts were not very fond of the idea that Ingrid should get a drivers license and start as a taxi driver – a job similar to the one she did and possible with her physical restriction: 36% opposed this statement and only 21% agreed. 47% think that Ingrid has postponed a decision on her career long enough; she should now make up her mind about what she really wants to be, take targeted action to qualify for this job and then build up a professional career around it. However, a high minority of 28% disagrees with this statement.

To sum up, what emerged as clear insights for the re-skilling of people with low qualifications in 2025 was that this group will continue to face difficulties in finding and maintaining employment. While attaining formal qualifications will remain vital for grasping new employment opportunities, informally acquired skills will be better recognised and mechanisms will be put in place that will allow people to obtain formal recognition for their professional expertise, by upgrading their skills with adequate and targeted training.

4.5 MARTINA: RE-SKILLING THE HIGHLY QUALIFIED

MARTINA	Formal	Non-formal	Informal
Schools			
Qualifying	X	**X**	X
Developing			

Persona description

At the age of 59, Martina realises that her high-powered career as a computer engineer has come to an end, due to the rise of new technologies which render her expertise obsolete. Martina wants to start a new career and qualify herself for a management position.

### 4.5.1 Overview of the results of the online consultation

Figure 9: Results of online consultation (part II) on the persona of Martina (in %, 135-139 responses)

4.5.2 Key questions and themes

The financial crisis of 2008 taught Europe that no industrial sector is immune to crisis and that any sector may be affected by sudden and unforeseen developments which could cause employers to massively dismiss even very highly qualified staff. In the future, it is expected that industries will change even more frequently and rapidly and, while in some areas innovation will cause sectors to transform and evolve, some areas of production and service provision will shut down and in other places new services and products will emerge that are developed in different, incompatible ways.

In the future, it might therefore become more common, even for very qualified workers, particularly if they are highly specialised, to be forced to re-skill because employment in their current area of expertise is not available anymore. The main question for the conception of the persona of Martina was therefore: What happens if somebody who has had a long and successful career in an area of high expertise has to re-qualify for a completely new job? What kind of jobs will be available for such a person? How can that person qualify for these jobs? Will age be an obstacle to re-employment or will seniority be valued as an asset?

4.5.3 Key Findings

The vast majority (78%) of experts shares the diagnosis that, in 2025 an increasing number of today's jobs will become obsolete and an increasing number of totally new jobs will be created; only 3% of experts disagree. Experts are divided as concerns the effects of this trend on highly skilled workers. 38% judge that specialised high-skilled workers may even face more difficulties when their jobs become obsolete than lower-skilled workers, whereas 40% contest this statement.

A high majority of 58% thinks that Martina and her company have overlooked technological and societal developments and thus did not manage to keep up and change strategy; only 12% disagree with this statement. Interestingly, an equally high majority of 59% thinks that there is nothing Martina or her company could have done to avoid the situation from arising. They claim that, in the future, all workers will re-skill and re-invent themselves several times over the course of their lives – only 15% disagree with this assessment.

Opinions are more divided on possible training strategies for Martina. 75% of experts agree that, in 2025, there will be abundant training and employment opportunities that assist people like Martina in converting experiences and personal skills into competences that are relevant for new job profiles. There is less agreement on viable strategies for Martina. One third of respondents feels that for Martina, it will be very difficult to qualify for a new job, because she is already 59 and would have to start from scratch. However, a very high number of experts (44%) unequivocally reject this supposition. Some (42%) believe that practical skill training without degrees or qualifications, e.g. on the job training combined with a variety of autodidactic training programmes simulating real job situations, could be a solution for Martina. A high minority of 23% does not believe in this solution, though.

In conclusion, the persona of Martina seems to address a complex set of open problems for which solutions are not easily found. Experts expect that, in the future, all European citizens, including those with high skills will have to face up to the fact that their expertise could become obsolete and that they might have to start a completely new career late in their professional lives. It is similarly uncontroversial that, in reaction to the increased flexibility of industry and labour market, there will be a variety of opportunities for re-skilling and changing professional profiles. However, opinions diverge on whether practical training alone, without formal qualifications, will be a viable option. Experts are equally divided on the question of whether older workers will face difficulties in re-qualifying for a new job, although a very high minority objects to this supposition.

4.6 SVEN: REINTEGRATION INTO THE LABOUR MARKET

SVEN	Formal	Non-formal	Informal
Schools			
Qualifying	X	X	**X**
Developing			

Persona description

Sven is 42-years old and has spent the last 12 years raising his children while his wife worked. Now, he would like to re-enter the workforce, but the industry he used to work in, does not exist anymore. His dream is to open up his own childcare centre.

4.6.1 Overview of the results of the online consultation
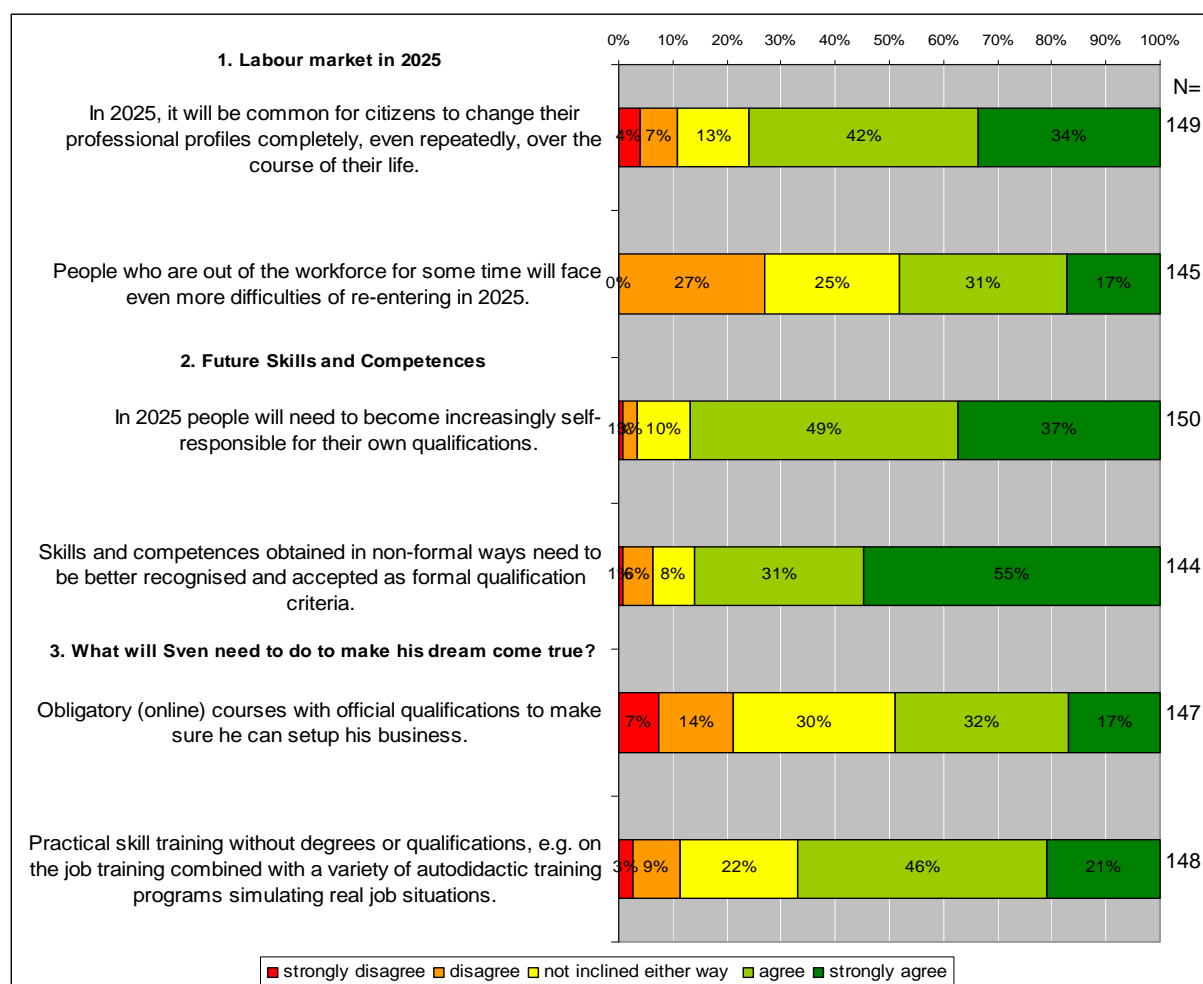
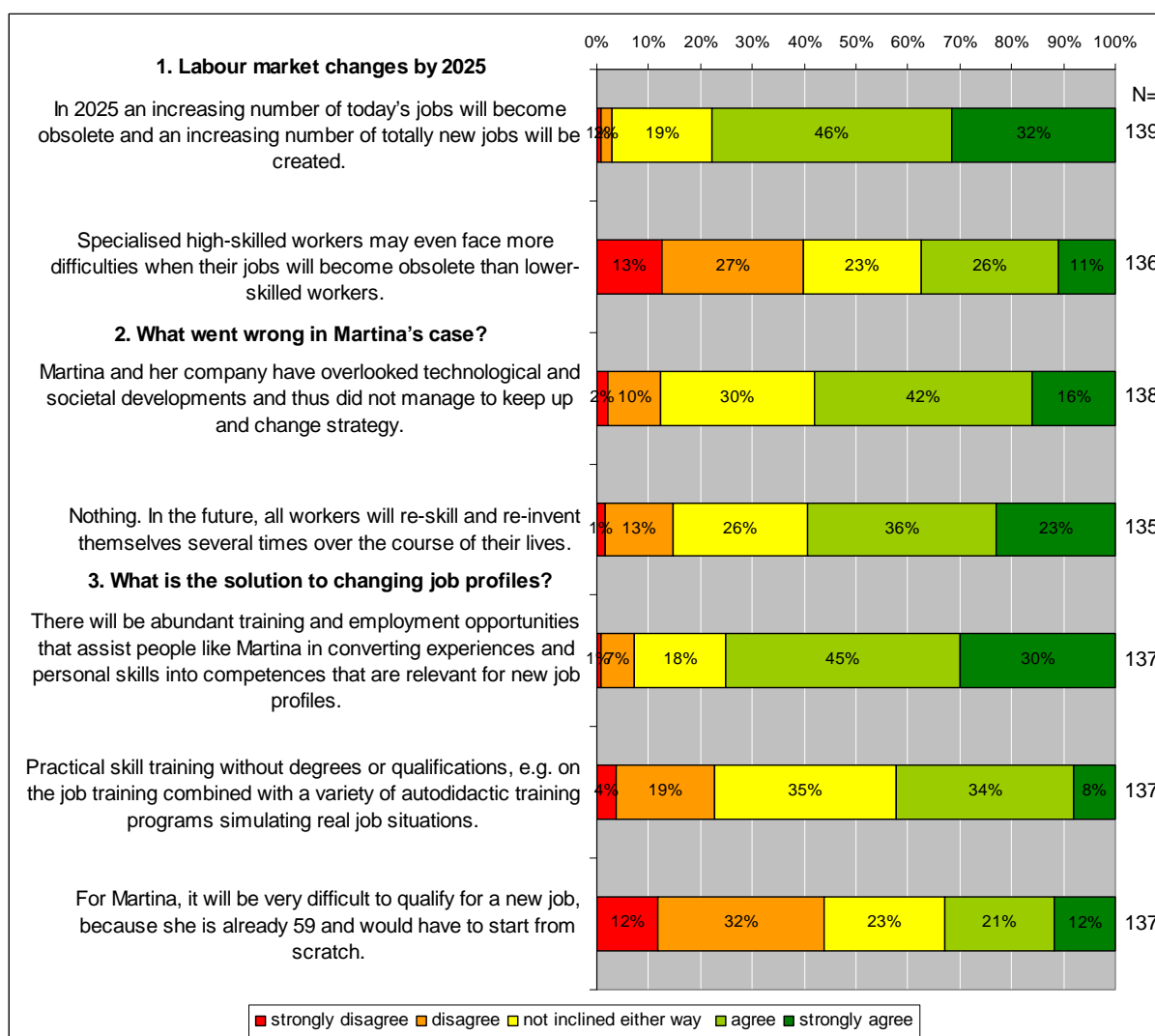**Figure 10: Results of online consultation (part II) on the persona of Sven (in %, 144-150 responses)**

4.6.2 Key questions and themes

Currently on average 69% of the 20-64 age cohort are employed in Europe, a rate that is significantly lower than in other parts of the world (Europe 2020). Only 63% of women as compared to 76% of men are in employment, and among older workers the employment rate

falls to 46%. While it is one of the targets of the Europe 2020 strategy to raise these numbers, it has to be acknowledged, that, at least at the moment, the number of jobs is the main factor restricting employment.

Therefore, one of the main targets of the Europe 2020 strategy is to increase the number of jobs available and ensure that a high level of employment opportunities is maintained. Now, the question is: What if we are successful? What if by 2025, say, there are enough job opportunities for everybody who wants to find work, maybe enough so that people have a choice? What will happen to the high number of people who have been unemployed for a longer time, for whatever reasons? How will these identify a suitable job for them? How will they qualify for such a job?

Thus the main question underlying the conception of Sven's persona was to investigate future strategies for re-integrating people into the labour market who have been out of employment for a longer period of time and have no chances (or interest) in entering into their former field of professional experience.

4.6.3 Key findings

A very high number of experts (76%) agrees that in 2025, it will be common for citizens to change their professional profiles completely, even repeatedly, over the course of their lives. Only 11% contest this finding. An even higher share of respondents (87%) believes that, in the future, people will need to become increasingly responsible for their own qualifications; a mere 3% disagree. Thus, we can say that the personas of Sven, Martina and Ingrid, according to experts, illustrate very common future situations and they emphasize that, due to increased labour market dynamics, people will have to assume responsibility for their qualifications and pro-actively develop their professional career.

As concerns the situation of those who have been out of work for a longer period of time, like Sven, opinions diverge. 48% of experts foresee that these will, in the future, face even more difficulties in re-entering the labour market, when compared to today, while 27% reject this supposition.

For the concrete training needs of Sven, who would like to set up his own business, a childcare centre, building on his experiences as full-time father, experts suggest a combination of strategies. Two thirds of experts believe that what Sven needs is practical training without degrees or qualifications, e.g. on-the-job training combined with a variety of autodidactic training programmes simulating real job situations; only 11% are not in favour of this approach. Almost half (49%) maintain that obligatory (online) courses with official qualifications to make sure he can set up his business are needed for someone who wants to manage a childcare centre. 21% of experts do not subscribe to this requirement. An overwhelming majority (86%) believes that, in the future, skills and competences obtained in non-formal ways need to be better recognised and accepted as formal qualification criteria. Only 6% disagree with this statement.

To sum up, experts believe that, in the future more and more often people will want to (or need to) enter job fields without possessing relevant formal qualifications. They emphasize that, to respond to this trend, informally acquired skills and non-professional experiences will have to be recognised. While formal qualifications will remain important and while it might be necessary to obtain certain licenses and degrees to be allowed to start working in a sensitive field, practical skills training, whether or not connected to a degree, will be more important to prepare people for a entering into a new job field.

4.7 JOSHUA: TRANSITION FROM HIGHER EDUCATION TO THE WORKPLACE

JOSHUA	Formal	Non-formal	Informal
~~Schools~~	tertiary education		
Qualifying	X		
Developing	X	X	X
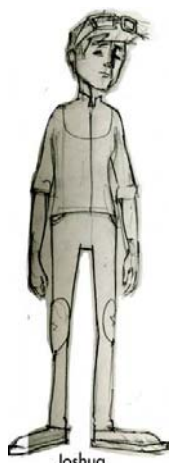
Persona description

Joshua is 23 and has just graduated from college, specialising in hotel management. In 2025, however, the vast majority of hotel guests are from Asian countries. Since Joshua does not speak any Asian language and has no knowledge of Asian culture and etiquette, he is unable to find a job.

### 4.7.1 Overview of the results of the online consultation
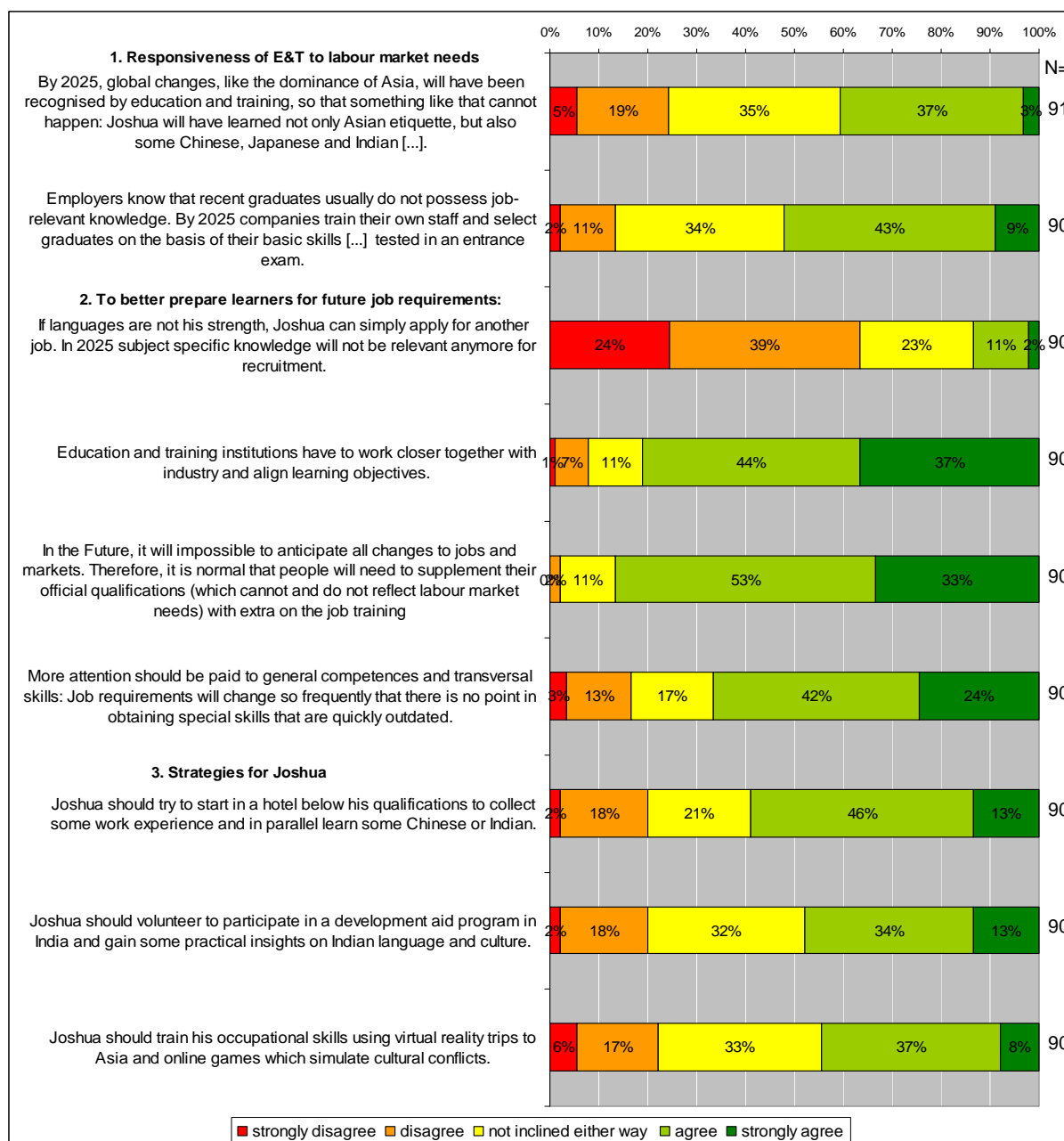
Figure 11: Results of online consultation (part III) on the persona of Joshua (in %, 90-91 responses)

33

4.7.2 Key questions and themes

The persona of Joshua, while touching many relevant themes, addresses a very specific problem, that is nonetheless extremely common. Young people finish their tertiary or vocational training and enter the labour market for the first time in their lives, only to realise that the competences they acquired in the course of their studies are not what they need to be successful in a job.

In this critical phase of transition from education and training to employment, many different aspects come into play. Many young people have not been trained for a clearly delimited job profile so that they have to assess their competences and preferences to develop an idea of the kind of professional career they would like to enter. But even once the decision for a certain sector or professional field has been taken, young people often have to realise that while their formal qualifications are a necessary requisite for being recruited, further competences and skills are required that have not been taught at school or university.

In the future, increased labour market dynamics together with changing professional profiles will further challenge young people in developing the skills they need to enter a professional field. Thus, the problem which led to the creation of the persona of Joshua was: What will happen, if tertiary education and vocational training become further dissociated from job requirements? How can young people at the beginning of their careers, develop necessary competences that are not taught at schools and universities? What would employers recognise and value as experiences and skills that show that a young graduate is fit for the job?

4.7.3 Key findings

A vast majority of 87% of experts maintain that it will impossible to anticipate all changes to jobs and markets in the future and that it will therefore be normal that people will need to supplement their official qualifications (which cannot and do not reflect labour market needs) with extra on-the-job training. Thus, experts generally believe that there will be an increasing gap between formal education and training and labour market needs. To close this gap, 81% believe that education and training institutions have to work more closely with industry and align learning objectives.

At the same time, it is expected by a slight majority of respondents (52%, with only 13% disagreeing) that employers know that recent graduates usually do not possess job-relevant knowledge; companies will train their own staff and select graduates on the basis of their basic skills tested in an entrance exam.

As concerns the responsiveness of education and training institutions to global changes, opinions diverge. 41% think that, by 2025, global changes, like the dominance of Asia, will have been recognised by education and training, so that something like that cannot happen: Joshua will have learned not only Asian etiquette, but also some Chinese, Japanese and Indian in the course of his studies. A significant minority of 24% does not believe that syllabi will be modified to such an extent.

As a general strategy for future competences development, two thirds assert that general competences and transversal skills deserve more attention, because job requirements will change so frequently that special skills will quickly become outdated.

In Joshua's concrete situation, all three strategies proposed were positively welcomed by around half of respondents, while in each case around 20% rejected the approach. The use of virtual reality trips to Asia and online games was greeted by 44% of participants; 48% subscribed to using the real life experience in a development aid programme in India as a training opportunity, while a majority of 59% favoured practical work experience collected in a hotel job below Joshua's qualifications. A majority of 63% rejected the idea that Joshua

should apply for another job and did not subscribe to the statement that, in 2025, subject specific knowledge will not be relevant anymore for recruitment.

Summarising these findings, experts agreed that, in the future the current gap between formally acquired skills and competences and labour market needs will not disappear, on the contrary, it will widen. However, they expect that both education and training institutions and the labour market will have reacted to the increasing discrepancies: the former by entering into a dialogue with industry and by adapting curricula and syllabi accordingly, and the latter by implementing their own testing and training schemes. However, given the increasing dynamics of international markets, neither strategy will manage to completely close the gap.

4.8 SLAVI: UP-SKILLING

SLAVI	Formal	Non-formal	Informal
Schools			
Qualifying			
Developing	X	**X**	X

Persona Description

Slavi has just been promoted from senior scientist to manager of the nanobot division of a biotech company. He wants this promotion, but he realises that his management and leadership skills need improvement. He would like to address his training needs without any of his colleagues or superiors noticing it.

### 4.8.1 Overview of the results of the online consultation
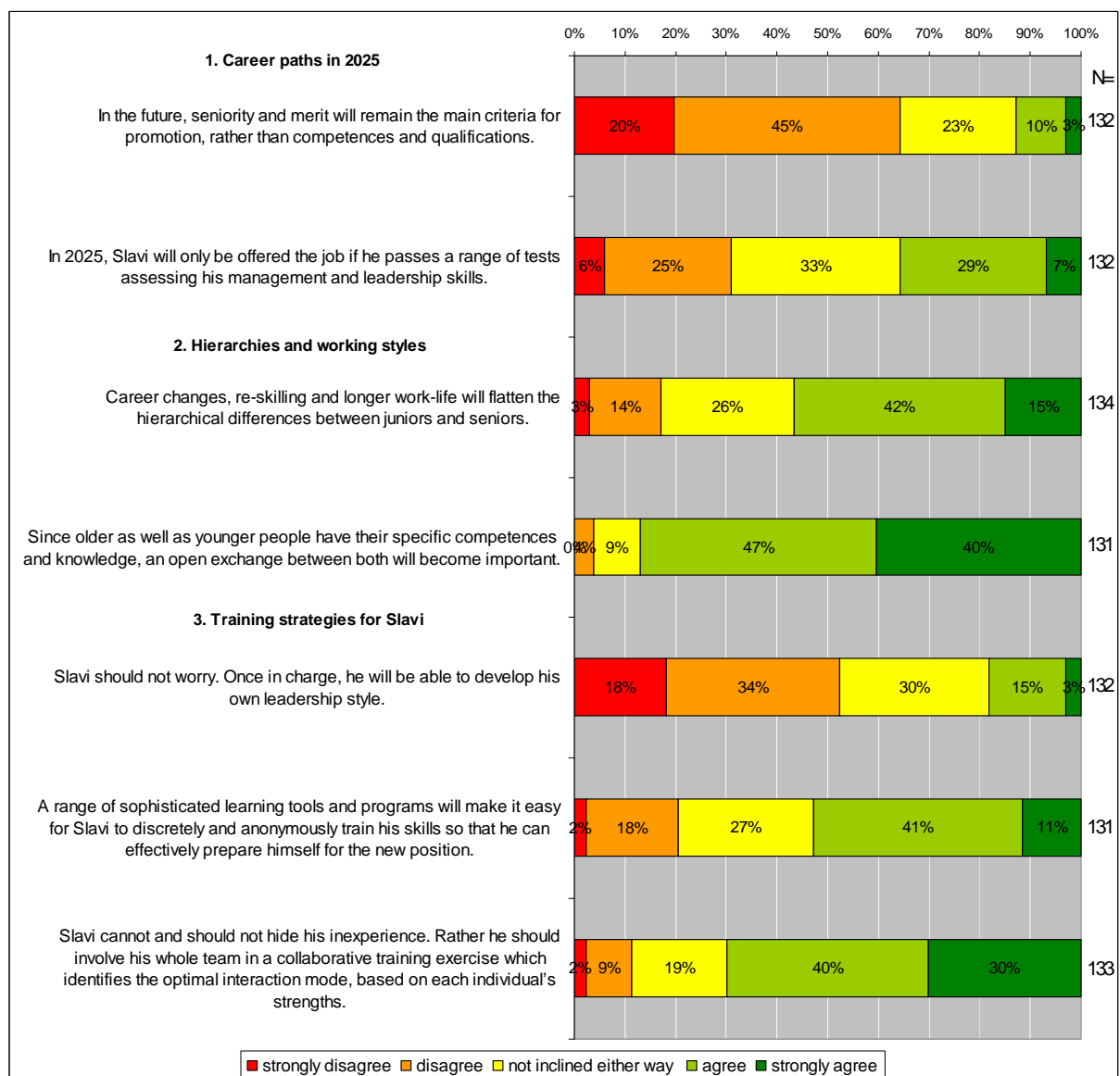
Figure 12: Results of online consultation (part II) on the persona of Slavi (in %, 131-134 responses)

4.8.2 Key questions and themes

The persona of Slavi addresses a training need that is currently not perceived as such, although it could be critical for developing the innovative potential of companies. Slavi represents the highly qualified and competent specialist, who, because of his achievements and his seniority is awarded a management post. Currently, such a promotion is usually not accompanied by any training or competence development strategies. It is commonly assumed that somebody who is competent and experienced in a specific field of expertise will be best equipped to strategically manage and guide the work in this field.

However, it is common knowledge that a good specialist is not necessarily a good manager or team leader and that a profound knowledge of the field of work and its potential is a necessary, albeit not sufficient, condition for strategically developing this field of action. Therefore, our question was: Will management and leadership still be awarded under a job promotion perspective? What can be done, in the future, to better prepare qualified and experienced people for a career promotion that requires different competences? How can such practical, job-relevant skills be effectively acquired?

4.8.3 Key findings

There is strong consensus among experts that, in the future, seniority and merit will not remain the main criteria for promotion and that competences and qualifications will become more important (with 64% agreeing and only 13% disagreeing). However, only 36% believe that employees will have to pass a range of tests assessing their management and leadership skills to be awarded a management post. A nearly equally high share of experts (31%) rejects this assumption.

An important change, that 87% of experts foresee, is that an open exchange between older and younger people will become more important. Furthermore a slight majority of 57% (with 17% disagreeing) believe that career changes, re-skilling and longer work-life will flatten the hierarchical differences between juniors and seniors.

As concerns concrete training strategies for people who are promoted to management positions for which they feel they lack key skills, 52% explicitly reject the idea that Slavi should not worry, because, once in charge, he will be able to develop his own leadership style. Only 11% subscribed to this current model of developing management and leadership skills. A similarly slight majority of 53% believe that technology will be an important facilitator for on the job training. They think that, in 2025, a range of sophisticated learning tools and programmes will make it easy for Slavi to discretely and anonymously train his skills so that he can effectively prepare himself for the new position.

On the third option, an idea that was included into the questionnaire as a wild card, encouraging out-of-the-box thinking, expert opinion thoroughly surprised the research team. A high majority of 70% subscribed to the idea that Slavi cannot and should not hide his inexperience. Rather he should involve his whole team in a collaborative training exercise which identifies the optimal interaction mode, based on each individual's strengths.

To sum up, what stands out from the expert feedback is the strong belief and expectation that in the future, professional relationships will change: hierarchies will flatten, an open approach between older and younger workers will prevail and even training needs will be openly and collaboratively addressed. In parallel to this process, privileges and benefits currently associated with seniority and experience will be challenged. Competences will become a more important criterion for promotion.

4.9 FRANK: TEACHERS
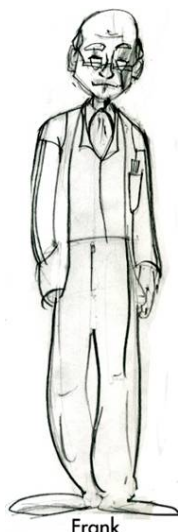
FRANK	Formal	Non-formal	Informal
Schools	X	X	X
Qualifying			
Developing			**X**

Persona description

Frank is 75 years old and has just retired from being a high school teacher. He believes in the importance of pedagogy and would like to help younger teachers by passing on his knowledge.

4.9.1 Overview of the results of the online consultation (survey IV)
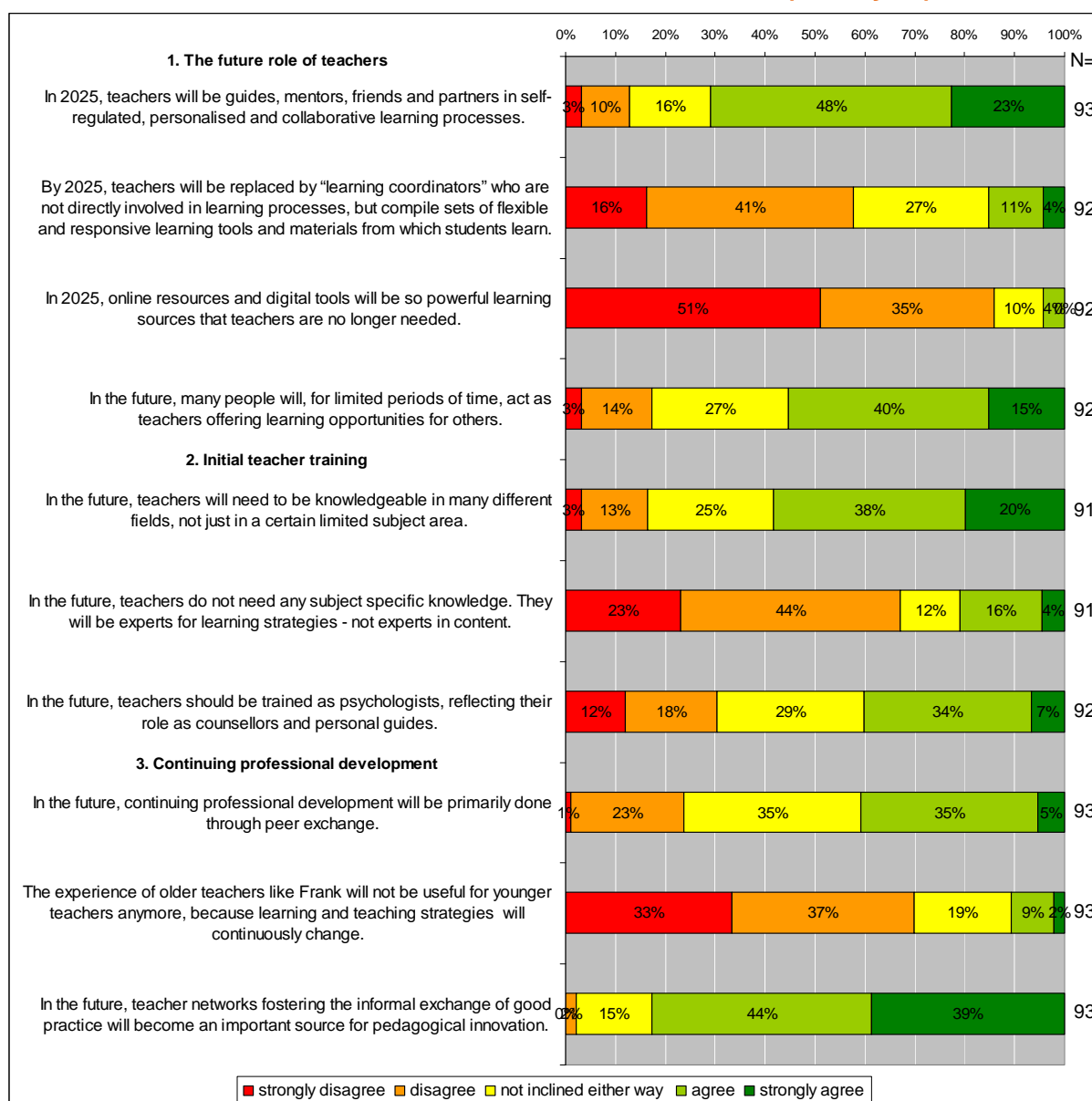
Figure 13: Results of online consultation (part IV) on the persona of Frank (in %, 91-93 responses)

4.9.2 Overview of the results of the pilot online consultation (survey I)
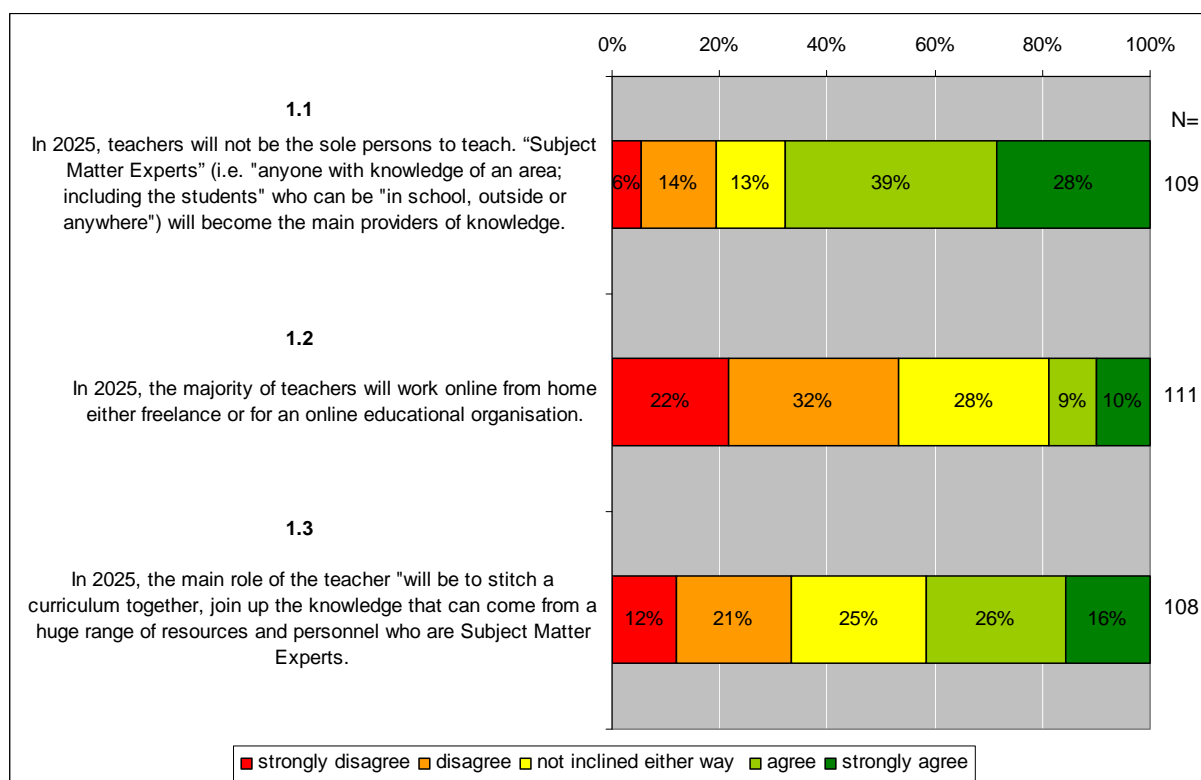
Figure 14: Online consultation (part I) on the future role of teachers (108-111 responses)

4.9.3 Key questions and themes

Frank is the most complex persona in this consultation exercise. On the one hand, as an individual, this character questions how, in the future, experiences and expertise collected over the course of a lifetime can be exploited as a source of training for younger colleagues. In this respect the key question is: How can older workers pass on their experiences and knowledge to the benefit of their younger colleagues and as a means of ensuring that implicit knowledge is not lost?

As a school teacher, the persona of Frank explores issues related to the future role of teachers and ways of preparing future teachers to assume this role while preserving teaching strategies that remain important. From this angle, the persona of Frank raises the question: What will be the future role of teachers and what are the changes necessary in teacher training and continuous professional development to support them in assuming this role?

4.9.4 Key findings

There is pronounced consensus on the future roles of teachers. According to 71% of experts (with only 13% disagreeing), in 2025, teachers will be guides, mentors, friends and partners in self-regulated, personalised and collaborative learning processes. 56% emphasize that teachers will not be replaced by "learning coordinators" who are not directly involved in learning processes, but compile sets of flexible and responsive learning tools and materials from which students learn (only 15% disagree). A very high majority of 86% doubts that, in 2025, online resources and digital tools will be so powerful that teachers are no longer needed. Thus, experts coincide that the teacher will continue to directly guide and intervene in learning processes. They will not become external observers and coordinators, but have a vital role to play as guides and mentors.

As concerns initial teacher training, experts are undecided on whether teachers should receive training as psychologists, given their new role as mentors and guides. While 40% subscribe to

this statement, 30% decidedly reject it. Experts tend to believe that teachers will need to be knowledgeable in many different fields, not just in a certain limited subject area (58% agreement compared to only 16% disagreement) and more than two thirds maintain that teachers will continue to need subject-specific knowledge, although a significant minority of 21% believes that they will instead become experts for learning strategies.

An overwhelming majority of 83% (2% dissent) emphasize that, in the future, teacher networks fostering the informal exchange of good practice will become an important source for pedagogical innovation. However, only 41% believe that continuing professional development will be primarily done through peer exchange; 24% reject this statement. At the same time, 70% underline that the experience of older teachers like Frank will still be useful for younger teachers; only 11% disagree.

In line with the findings on the consultation of the persona of Emma, experts believe that schools will open up to society in the future and start to flexibly integrate real life learning opportunities. A slight majority of 55% of experts assert that, in the future, many people will, for limited periods of time, act as teachers offering learning opportunities for others. These findings are corroborated by the results of the first pilot survey on the role of teachers, where 68% of respondents maintained that teachers will not be the only people teaching; instead anyone with knowledge of an area, including the students themselves, will contribute to learning processes.

In conclusion, it appears that, while experts underline the importance of informal knowledge exchange and teacher networks as a source for professional development, their views on initial teacher training are more traditional, emphasizing the importance of subject specific knowledge, albeit in a much broader field of expertise. There is strong consensus that the teacher's role is changing and in the future teacher will become mentors and guides, while learning processes become self-regulated, personalised and collaborative. However, it is underlined that the teacher will actively engage in learning processes and remain a vital actor in the learning process.

5. CONCLUSIONS

Formal Education and Training in 2020-2030

Experts agree that the existing, physical and formal structures of school education will remain more or less intact. Only 14% of experts believe that, by 2025, schools will have disappeared altogether and be replaced by learning opportunities that are integrated in life and society; 72% oppose this statement, almost half even strongly disagree. Similarly, only a few (14%) think that standardised degrees and testing procedures will have disappeared; a high majority of 62% considers this unlikely.

However, schools will change significantly with respect to their internal processes and pedagogical strategies. A high majority of 78% contends that, by 2025, schools will have implemented personalised learning plans that take into account individual needs, interests and preferences. An even higher share of 85% believe that technology will allow schools and educators to create tailor-made learning experiences which increase learning outcomes. A vast majority of experts (92%) emphasize that the advantages of technologies need to be better exploited for personalising school education.

Personalised learning strategies will be accompanied by changes in teaching practice. According to a vast majority of 71% of experts (with only 13% disagreeing), in the future teachers and trainers will be guides, mentors, friends and partners in self-regulated, personalised and collaborative learning processes. Teachers will remain important actors guiding the learning process, which is underlined by the fact that a very high majority of 86% doubts that online resources and digital tools will be so powerful that teachers are no longer needed and 58% emphasize that teachers will not become or be replaced by "learning coordinators" who are not directly involved in learning processes.

Moreover, other forms and places of learning, such as in virtual networks or local community centres might become more important. 76% believe, for example, that, in the future, there will be a range of technological tools available that will help students to design their own learning trajectory, combining face-to-face tuition at school with online university courses and online learning communities. However, opinions are divided on how far institutional barriers will be overcome. 49% of respondents consider it likely that, in the future, students will not be enrolled at a single school, but combine courses and resources from different educational institutions and decide themselves which local and virtual learning communities to join. A significant minority (22%) rejects this supposition.

Migration and integration will also shape the future of formal education and training. A high proportion of 71% of experts (with only 10% opposing) maintain that multicultural classrooms will become the norm and that therefore new strategies for teaching and learning are required. As a consequence, cultural awareness and inter-cultural communication will become an important subject in school education, as emphasized by 70% of respondents (with only 4% disagreeing). 63% of experts are optimistic that, by 2025, it will have become normal for schools to provide support and training for pupils with insufficient language skills (only 6% dissent).

As concerns tertiary education and vocational training in particular, experts generally expect that formal qualifications and degrees will not be enough to qualify for a job and that the competences acquired in formal education and training will not match labour market needs. A vast majority of 87% of experts believe that it will become normal for university graduates to supplement their official qualifications to qualify for a job. A majority expects employers to develop their own selection and training strategies in response to the skills mismatch (52%, with only 13% disagreeing).

There is a high agreement on policy measures to assist school and universities in addressing future learning needs. To support personalised learning strategies, 88% of respondents think that education and training institutions will have to implement better monitoring and assessment mechanisms which detect individual learning needs; 82% advocate that curricula will need to take into account students' interests; and 66% maintain that learning will need to become competence based, rather than knowledge based.

To enter into dialogue with society and become more responsive to social reality and labour market needs, 84% of respondents argue that schools will need to cooperate more closely with universities and enterprises to help students in their career choices and 90% of respondents assert that schools will have to increase their efforts to open up to society and integrate real life experiences into their teaching practices. 73% believe that many different societal stakeholders will need to be involved to achieve the transformation we need in formal education. As a general strategy for future competences development, 67% assert that general competences and transversal skills deserve more attention to enable students to become lifelong learners.

Experts strongly believe that these two strategies – institutional openness and personalised learning – will also contribute to effectively reducing the rate of early school leavers in the future. While experts are, on the whole, optimistic as concerns the capacity of school education to respond to societal change, they underline that strong and principled political leadership and greater openness and flexibility amongst educators are needed for schools to embrace multiculturalism and accommodate the needs of migrant students. Again, personalised learning strategies and interaction with society are considered key for improving the educational attainment of migrant children.

Employment and Career Development

In the future, it will be common for all citizens – whether they are at the beginning or end of their career, whether they are highly skilled or do not have any relevant qualifications – to continuously update their skills. The vast majority (78%) of experts shares the diagnosis that, in 2025 an increasing number of today's jobs will become obsolete and an increasing number of totally new jobs will be created; only 3% of experts disagree. Due to increased labour market dynamics, people will have to assume responsibility for their qualifications and pro-actively develop their professional careers. A very high number of experts (76%) maintain that it will be common for citizens to change their professional profiles completely, even repeatedly, during their lives. Only 11% contest this finding. An even higher share of respondents (87%) believe that, in the future, people will need to become increasingly responsible for their own qualifications; a mere 3% disagree.

On the whole, there is a strong belief by 75% of experts that, in 2025, there will be abundant training and employment opportunities that will assist people in converting professional experiences and personal skills into competences that are relevant for new job profiles. However, experts repeatedly and almost unanimously (86% with only 6% opposing) underline that, to meet future employment needs in view of increasing labour market dynamics, informally acquired skills will need to become better recognised and formalised to complement or supplement formally attained qualifications. Most experts are optimistic that, in 10 years time, corresponding changes will have occurred. 56% believe (only 14% disbelieve) that, by 2025, informal learning experiences will have been recognised as a valuable asset for a new job. 60% think that standardised tests will be put in place to obtain recognition for informally acquired skills (only 15% are doubtful).

Opinions are divided on whether age will affect the chances of re-entering the labour market or qualifying for a new job profile; 33% believe that older workers will find it very difficult to

qualify for a job in a new field, while 44% unequivocally reject this supposition. Views also diverge on the usefulness of practical skills training, which two thirds of experts favour for people re-entering the labour market after a longer period of being out of work, while for re-skilling, experts are less fond of this option (42% in favour; 23% opposed). Also, there is almost unanimous agreement that people with low levels of qualifications should aspire to formally upgrading their qualifications to increase their labour market opportunities.

Thus, while attaining formal qualifications will remain vital for grasping new employment opportunities, informally acquired skills will be better recognised and mechanisms will be put in place that will allow people to obtain formal recognition for their professional expertise, by upgrading their skills with adequate and targeted training. ICT will play an important role in facilitating lifelong learning opportunities. 53% of experts believe that a range of sophisticated learning tools and programmes will make it easy for people to upgrade their skills (21% are doubtful); 83% believe that online networks for peer exchange can support professional development and 84% highlight that online courses allow people to gain qualifications while remaining in employment.

Common Trends

Synthesizing the findings emphasized in each of the nine scenarios, some common threats and trends emerge that shed some light on the education and training needs and strategies from 2020 to 2030.

For the young generation, schools will remain the main provider of learning opportunities. The existing, physical and formal structures of school education will remain intact. However, schools will change significantly with respect to pedagogical strategies. On the one hand, learning and teaching processes will have become more flexible in addressing and implementing individual needs and preferences. Teacher will become mentors and guides, while learning processes will become self-regulated, personalised and collaborative. Personalised learning strategies will benefit all learners alike and will contribute to preventing early school leaving. On the other hand, schools as institutions will open up to society by integrating external learning resources and practical learning opportunities. School will have embraced the multicultural classroom and implemented effective mechanisms to integrate migrant children. It is considered that technology will be a facilitator for both of these strands, driving change.

As concerns strategies for professional and career development, in the future, all citizens – whether they are at the beginning or end of their careers, whether they are highly qualified or only possess basic skills – will have to continuously update and develop their skills; assume responsibility for their qualifications and pro-actively develop their professional careers. The current gap between formally acquired skills and competences and labour market needs will not disappear - on the contrary, it will widen. However, in reaction to increased labour market dynamics there will be a variety of opportunities for re-skilling and changing professional profiles. While attaining formal qualifications will remain vital for grasping new employment opportunities, informally acquired skills will be better recognised and mechanisms will be put in place that will allow people to obtain formal recognition for their professional expertise, by upgrading their skills with adequate and targeted training. Informal knowledge exchange in networks will become an important source for professional development.

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A. Initial Approach: Qualitative Online Discussion

1. Overview

	The role(s) of teachers and learners in 2025 The role of the teacher as the central figure and authority in education is likely to have changed fundamentally by 2025. We can identify at least four main developments that are at the root of these changes. Click **here** for more information, and to find out what Frank – a teacher living in 2025 – has to say about these changes.
	The school of the future? In 2025, learning will no longer be restricted to the boundaries of school. In addition to schools, many other organizations – from companies to NGOs – will provide learning modules. Schools will become central hubs that arrange learning paths with learning modules from within and outside their organisations. Click **here** for discussing the future of Emma and the future of school in 2025.
	Inclusion We want to discuss what challenges and opportunities we see ahead if we want to achieve a learning society for all European citizens. Are there threats to inclusion, as depicted in the storyline below? What can be done about this? And what should be the roles of government and private organizations? The story below is about Chanta, a 6 year old girl that emigrated with her parents from Cambodia to France and finds herself in the uncomfortable position of having to attend school without speaking the language. The question is how we can ensure that education is inclusive, also to fragile groups in society such as immigrants or disabled people. Based on your input, we will write a short summary of the main points and share that with the Future of Learning community. Click here for discussing the future of Chanta and educational inclusion.

2. Storyline Frank

The role of the teacher as the central figure and authority in education is likely to have changed fundamentally by 2025. We can identify at least four main developments that are at the root of these changes:

First, we envision an overhaul of how teachers and learners interact. New ICT technologies enable a more collaborative relationship between teachers and learners and provide more room for customized learning. We believe that the teacher will lose the role as a gatekeeper to knowledge and instead become a guide for learners, helping them decide which learning path is most suitable for them.

Second, we envision the emergence of what we like to call 'peer teaching': learners teaching one another. So-called proto-professionals will emerge, people that have teaching skills and knowledge but who are not officially qualified and do not work as teachers. The distinction between professional and amateur teachers will blur. Also, learners will look at successful learning paths of others, and copy them. We call these crowd-sourced learning paths.

Third, we believe that in the future, teachers can again focus on their prime activity: teaching. Some of their secondary activities, most notably assessment, will be conducted by other organisations than the school that they work for.

Finally, demographic changes in the years before 2025 will reduce the number of teachers available for face-to-face teaching. This will lead to an increasing dependence on technology.

We also see some challenges ahead, in particular with regards to the deployment of technology in schools. There are still many open questions regarding the roles of the human teacher and technology in future learning processes.

With that in mind, we would like to introduce you to Frank, who lives in the Netherlands in 2025. Frank has been a teacher his whole life and is now reaching the official retirement age of 75. With his life long experience in teaching and having witnessed the integration of ICT technology for many years, he has thought much about what the role of the teacher vis-à-vis the technology should be.
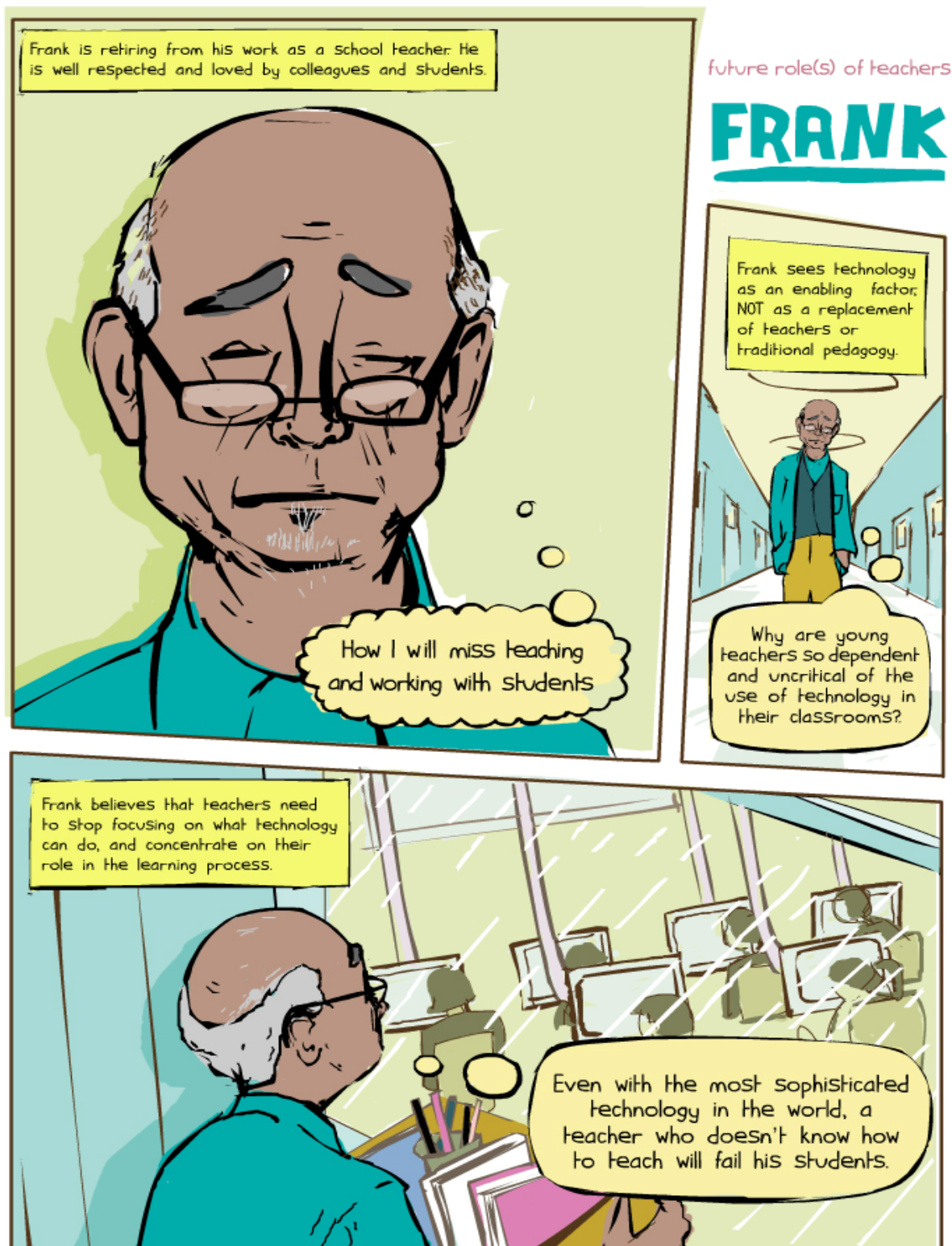
So what do you think? Do you agree with Frank?

What do you think the role of the teacher should be in the future with regard to technology and learners?

Please leave a comment below and start the discussion!

3. Storyline Emma

The school of the future?

In 2025, learning will no longer be restricted to the boundaries of school. In addition to schools, many other organizations – from companies to NGOs – will provide learning modules. Schools will become central hubs that arrange learning paths with learning modules from within and outside their organisations.
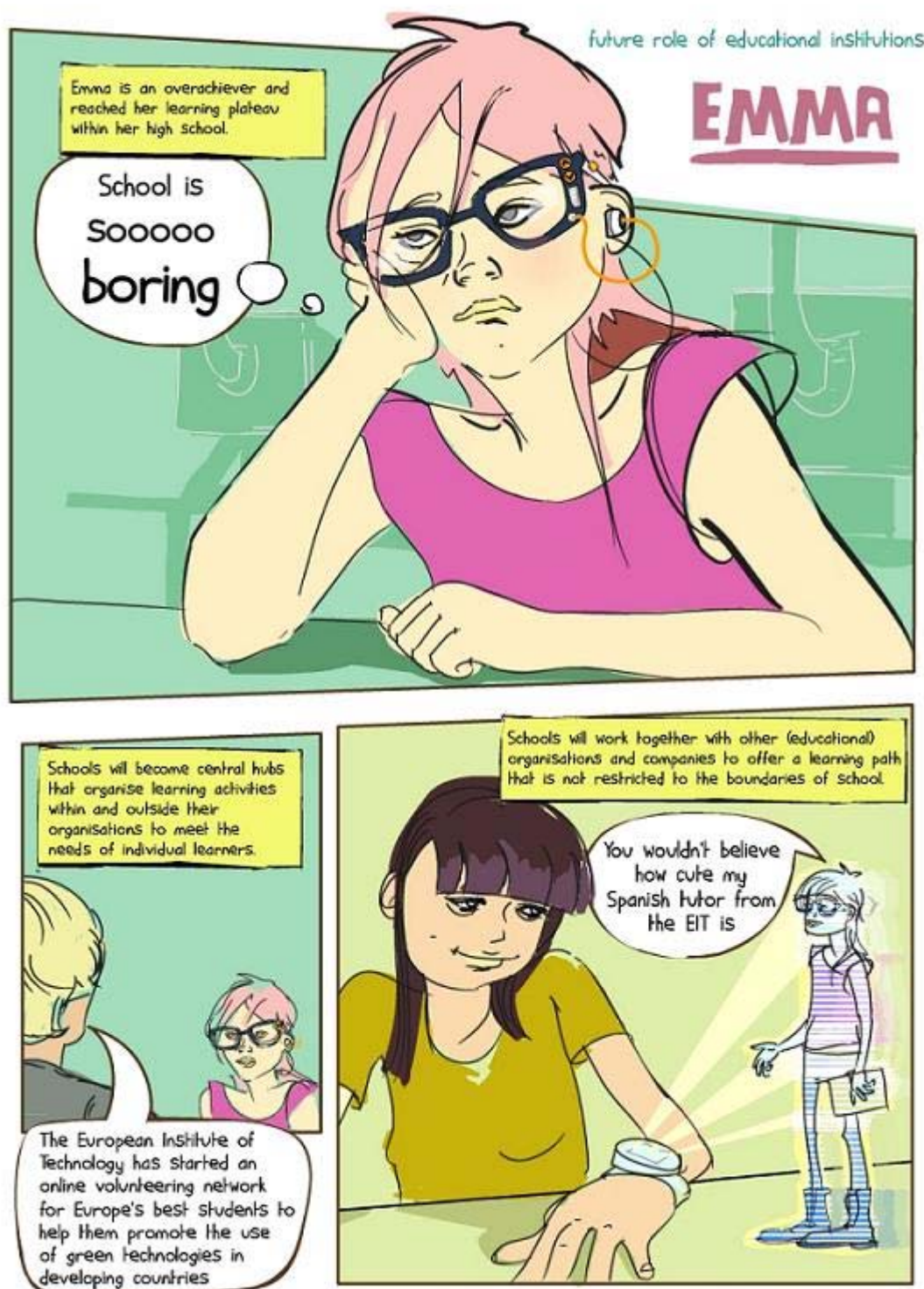
Is this the school of the future? Please leave a comment below and start the discussion!

4. Storyline Chanta

Inclusion

The acquisition of knowledge and competences is very important for the wellbeing of individual citizens. "Key competences in the EU framework are those that 'all individuals need for personal fulfilment and development, active citizenship, social inclusion and employment' (Gordon et al, 2009)". Inclusion – in this context access to learning key knowledge and competences for all – is very important for our knowledge society.

This week, we want to discuss what challenges and opportunities we see ahead if we want to achieve a learning society for all European citizens. Are there threats to inclusion, as depicted in the storyline below? What can be done about this? And what should be the roles of government and private organizations? The story below is about Chanta, a 6 year old girl that emigrated with her parents from Cambodia to France and finds herself in the uncomfortable position of having to attend school without speaking the language. The question is how we can ensure that education is inclusive, also to fragile groups in society such as immigrants or disabled people. Based on your input, we will write a short summary of the main points and share that with the Future of Learning community.

B. Survey I: Reflection and consolidation of initial findings

Dear Participant in the Future of Learning Community,

In the course of our project we have consulted with experts and stakeholders in several ways to obtain your views about the future of learning – what it will look like and how it will take shape. At this point we would like to ask you to reflect on some of the participant feedback we have obtained through a short survey on three themes, with only 3 questions per theme: the future role of teachers, the changing roles of institutions, and the issue of inclusion.

I. The Role of Teachers

1a. Do you agree with the following statement made by one of your colleagues? In 2025, teachers will not be the sole persons to teach. "Subject Matter Experts" (i.e. "anyone with knowledge of an area; including the students" who can be "in school, outside or anywhere") will become the main providers of knowledge.

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

1b. If you agree, in which ways will the role of the teacher change? (If you don't agree: why not?)

2a. Do you agree with the following statement made by one of your colleagues? "In 2025, the majority of teachers will work online from home either freelance or for an online educational organisation."

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

2b. Could you explain your answer?

3a. Do you agree or disagree with the statement: In 2025, the main role of the teacher "will be to stitch a curriculum together, join up the knowledge that can come from a huge range of resources and personnel who are Subject Matter Experts".

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

3b. If you agree, how do you think this knowledge exchange will be organised? (If you don't agree: why not?)

II. Institutional Change

4a. Do you agree with the following statement made by one of your colleagues? "In 2025, existing structures of formal education and training have remained intact."

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

4b. If you agree, how do you envisage the future (institutional) framework for learning? (If you don't agree: why not?)

5a. Do you agree with the following statement made by one of your colleagues: "In 2025, many different societal stakeholders will be involved in education if we are to achieve the transformation we need in formal education."

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

5b. If you agree, which "societal stakeholders" are most relevant in your opinion and how could / should they be "involved"? (If you don't agree: why not?)

6a. To what extent do you agree or disagree with the following statement? "In 2025, educational institutions will be replaced by community knowledge centres serving both geographically close by communities and widely dispersed topic-communities".

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

6b. If you agree can you elaborate on the possible roles of community knowledge centres? If you disagree, why do you think this is not a feasible idea?

III. Inclusion

7a. Do you agree with the following statement made by one of your colleagues? "For education to be inclusive in 2025, it needs to embrace mixed and multiple cultures". This requires strong and principled political leadership at one end but also greater openness and flexibility amongst educators at the other."

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

7b. If you agree, how do you think this can be achieved? (If you don't agree: why not?)

8a. Do you agree with the following statement of one of your colleagues? "Collective learning (i.e. learning in networks, where learners teach each other) will not benefit all groups of learners. In particular, fragile groups will have difficulties with such a system".

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

8b. Can you explain your answer?

9a. Do you agree with the following statement? "In 2025 technology will be more important in education then it is today. This will lead to a widening gap between those that have access to educational technology, and those that do not".

	1	2	3	4	5	
Strongly Disagree	☐	☐	☐	☐	☐	Strongly Agree

9b. Can you explain your answer?

Themes: (1) Re-integration into the labour market; (2) Re-Skilling; (3) Up skilling
Personas: (1) Sven, (2) Martina; (3) Slavi

Sven

1. Re-integration into the labour market

Sven is 42-years old and has spent the last 12 years raising his children while his wife worked. Now, he would like to re-enter the workforce, but the industry he used to work in, does not exist anymore. His dream is to open up his own childcare centre.

Please rate the following statements (1=strongly disagree - 5=strongly agree):

	1	2	3	4	5
Labour Market in 2025					
In 2025, it will be common for citizens to change their professional profiles completely, even repeatedly, over the course of their life.					
People who are out of the workforce for some time will face even more difficulties of re-entering in 2025					
Future Skills and Competences					
In 2025 people will need to become increasingly self-responsible for their own qualifications					
Skills and competences obtained in non-formal ways need to be better recognised and accepted as formal qualification criteria					
What will Sven need to do in 2025 to make his dream come true?					
Obligatory (online) courses with official qualifications to make sure he can setup his business.					
Practical skill training without degrees or qualifications, e.g. on the job training combined with a variety of autodidactic training programmes simulating real job situations.					

Space for your comments and ideas:

2. Aspects of Lifelong Learning: Re-skilling

At the age of 59, Martina has to realise that her high-powered career as a computer engineer has come to an end due to the rise of new technologies which render her expertise obsolete. Martina wants to start a new career and qualify herself for a management position.

Please rate the following statements (1=strongly disagree - 5=strongly agree):

Labour market changes by 2025	1	2	3	4	5
In 2025 an increasing number of today's jobs will become obsolete and an increasing number of totally new jobs will be created					
Specialised high-skilled workers may even face more difficulties when their jobs will become obsolete than lower-skilled workers					
What went wrong in Martina's case?					
Martina and her company have overlooked technological and societal developments and thus did not manage to keep up and change strategy					
Nothing. In the future, all workers will re-skill and re-invent themselves several times over the course of their lives.					
What is the solution to changing job profiles?					
There will be abundant training and employment opportunities that assist people like Martina in converting experiences and personal skills into competences that are relevant for new job profiles.					
For Martina, it will be very difficult to qualify for a new job, because she is already 59 and would have to start from scratch.					

Space for your comments and ideas:

Slavi

3. Aspects of Lifelong Learning: Up-skilling

Slavi has just been promoted from senior scientist to manager of the nanobot division of a biotech company. He wants this promotion, but he realises that his management and leadership skills need improvement. He would like to address his training needs without any of his colleagues or superiors noticing it.

Please rate the following statements (1=strongly disagree - 5=strongly agree):

Career paths in 2025	1	2	3	4	5
In the future, seniority and merit will remain the main criteria for promotion, rather than competences and qualifications.					
In 2025, Slavi will only be offered the job if he passes a range of tests assessing his management and leadership skills.					
Hierarchies and working styles					
Career changes, re-skilling and longer work-life will flatten the hierarchical differences between juniors and seniors.					
Since older as well as younger people have their specific competences and knowledge, an open exchange between both will become important.					
Training strategies for Slavi					
Slavi should not worry. Once in charge, he will be able to develop his own leadership style.					
A range of sophisticated learning tools and programmes will make it easy for Slavi to discretely and anonymously train his skills so that he can effectively prepare himself for the new position.					
Slavi cannot and should not hide his inexperience. Rather he should involve his whole team in a collaborative training exercise which identifies the optimal interaction mode, based on each individual's strengths.					

Space for your comments and ideas:

Themes: (1) Aligning E&T with labour market needs; (2) Early School Leaving; (3) Low qualifications
Personas: (1) Joshua, (2) Bruno, (3) Ingrid

Bruno

2. Early School Leaving

Bruno is 14 years old and really not interested in school anymore. He spends his days hanging around with friends and playing computer games instead of going to school.

Please rate the following statements (1=strongly disagree - 5=strongly agree):

Early School Leaving in 2025	1	2	3	4	5
In 2025, early school leaving will be a greater problem					
…because:					
young people will learn informally, like in social networks, and will thus be even less interested in formal E&T;					
an increasing number of pupils will not be able to cope with the rising expectations					
social divides will increase, unemployment will spread, more and more young people will be left behind by society					
In 2025, early school leaving will be less of a problem					
…because					
there will be a variety of ways in which degrees can be obtained and students with different needs and interests will more easily find a learning option that suits them					
informal learning will have become recognised and practical experiences are more important than degrees and qualifications					
Schools will have disappeared altogether and be replaced by learning opportunities that are integrated in life and society.					
Future strategies to fight early school leaving include...					
Personalising school education to better meet individual needs and interests					
3D virtual worlds and computer games to encourage and motivate students					
Opening up educational institution to society; embedding learning in the social life of a community; integrated work experiences					

Space for your comments and ideas:
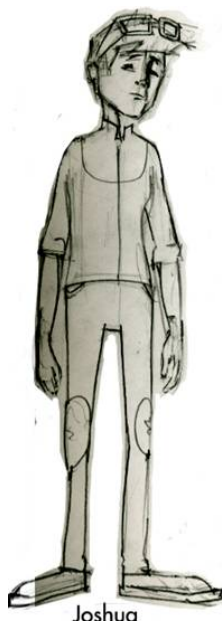
Joshua

1. Transition from Higher Education to the Workplace

Joshua is 23 and has just graduated from college, specialising in hotel management. In 2025, however, the vast majority of hotel guests are from Asian countries. Since Joshua does not speak any Asian language and has no knowledge of Asian culture and etiquette, he is unable to find a job.

Please rate the following statements (1=strongly disagree - 5=strongly agree):

Responsiveness of E&T to labour market needs	1	2	3	4	5
By 2025, global changes, like the dominance of Asia, will have been recognised by education and training, so that something like that cannot happen: Joshua will have learned not only Asian etiquette, but also some Chinese, Japanese and Indian in the course of his studies.					
Employers know that recent graduates usually do not possess job-relevant knowledge. Companies train their own staff and select graduates on the basis of their basic skills – reasoning, judgement and communication skills – tested in an entrance exam.					
If languages are not his strength, Joshua can simply apply for another job. In 2025 subject specific knowledge will not be relevant anymore for recruitment.					
To better prepare learners for future job requirements….					
Education and training institutions have to work closer together with industry and align learning objectives.					
In the Future, it will impossible to anticipate all changes to jobs and markets. Therefore, it is normal that people will need to supplement their official qualifications (which cannot and do not reflect labour market needs) with extra on the job training.					
More attention should be paid to general competences and transversal skills: Job requirements will change so frequently that there is no point in obtaining special skills that are quickly outdated					
Strategies for Joshua					
Joshua should try to start in a hotel below his qualifications to collect some work experience and in parallel learn some Chinese or Indian.					
Joshua should volunteer to participate in a development aid programme in India and gain some practical insights on Indian language and culture.					
Joshua should train his occupational skills using virtual reality trips to Asia and online games which simulate cultural conflicts.					

Space for your comments and ideas:
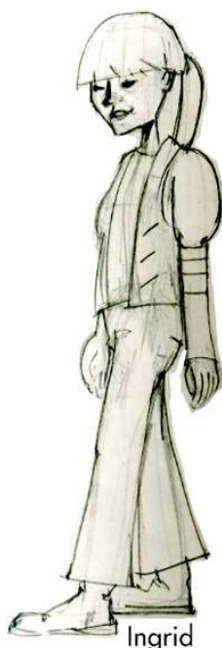
3. Low-skilled workers

After secondary school, Ingrid started to travel the world, financing her life by working as a bike courier. After an accident, at the age of 32, she is left with a limp leg and has to find some other form of income.

Please rate the following statements (1=strongly disagree - 5=strongly agree):

Labour market developments	1	2	3	4	5
By 2025, there will be less employment opportunities for workers with no or low qualifications. Nearly all jobs will require a higher level of skills than today.					
In 2025, there will still be jobs that do not require professional qualifications. However, these will (mostly) involve physical work, which Ingrid might not be able to do.					
Recognition of informal learning and professional experience in 2025					
By 2025, Ingrid's informal learning experiences – gained through travelling and working - will have been recognised as a valuable asset for a new job, maybe in a travel agency.					
In 2025 Ingrid will be able to obtain official recognition of her skills by taking a standardised test certifying her level of experience. She can then build onto this with further targeted training.					
In 2025, all jobs will require some kind of entrance exam assessing candidate's occupational skills. For many jobs, prior qualifications will be irrelevant – only the exam will matter.					
Strategies for Ingrid					
Ingrid should get a drivers license and start as a taxi driver – a job similar to the one she did and possible with her physical restriction.					
Ingrid should aspire to upgrade her qualifications to have more employment options, also in view of the future. She could, for example, start a university course in a subject of her choice, like languages or cultural studies – online and part-time while doing some provisional kind of work.					
Ingrid has postponed decision on her career long enough. She should now make up her mind about what she really wants to be, take targeted action to qualify for this job and then build up a professional career around it.					

Space for your comments and ideas:

Themes: (1) The future role of teachers; (2) Personalisation; (3) Equity & Inclusion (Chanta)
Personas: (1) Frank; (2) Emma; (3) Chanta
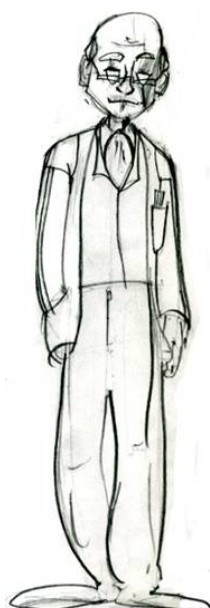
Frank

1. Teachers

Frank is 75 years old and has just retired from being a high school teacher. He believes in the importance of pedagogy and would like to help younger teachers by passing on his knowledge.

Please rate the following statements (1=strongly disagree - 5=strongly agree):

The future role of teachers	1	2	3	4	5
In 2025, teachers will be guides, mentors, friends and partners in self-regulated, personalised and collaborative learning processes.					
By 2025, teachers will be replaced by "learning coordinators" who are not directly involved in learning processes, but compile sets of flexible and responsive learning tools and materials from which students learn.					
In 2025, online resources and digital tools will be so powerful learning sources that teachers are no longer needed.					
In the future, many people will, for limited periods of time, act as teachers offering learning opportunities for others.					
Initial teacher training					
In the future, teachers will need to be knowledgeable in many different fields, not just in a certain limited subject area.					
In the future, teachers do not need any subject specific knowledge. They will be experts for learning strategies - not experts in content.					
In the future, teachers should be trained as psychologists, reflecting their role as counsellors and personal guides.					
Continuing professional development					
By 2025, pedagogical concepts will have changed completely.					
In the future, continuing professional development will be primarily done through peer exchange.					
The experience of older teachers like Frank will not be useful for younger teachers anymore, because learning and teaching strategies will continuously change.					
In the future, teacher networks fostering the informal exchange of good practice will become an important source for pedagogical innovation.					

Space for your comments and ideas:

2. Personalisation

Emma is 16 and a good student who generally enjoys learning. However, school bores her. There are so many things she wants to know, to say and to do and no room to express herself. She can't wait to get to university where she hopes to be finally treated like an adult.

Please rate the following statements (1=strongly disagree - 5=strongly agree):

The school of the future	1	2	3	4	5
By 2025, schools will have implemented personalised learning plans that take into account individual needs, interests and preferences.					
Technology will allow schools and educators to create tailor-made learning experiences which increase learning outcomes.					
By 2025, standardised degrees and testing procedures will have disappeared.					
In the future, students will not be enrolled at a single school, but combine courses and resources from different educational institutions and decide themselves which local and virtual learning communities to join.					
To better address future learning needs ….					
Education and training institutions have to implement better monitoring and assessment mechanisms which detect individual learning needs.					
Curricula need to take into account students' interests.					
Learning needs to become competence based, rather than knowledge based.					
Schools have to increase their efforts to open up to society and integrate real life experiences into their teaching practices.					
Schools need to cooperate closer with university and enterprises to help students in their career choice.					
The advantages of technologies need to be better exploited for personalising school education.					
Future strategies for Emma					
A range of technological tools will help Emma to design her own (accredited) learning trajectory, combining face-to-face tuition at school with online university courses and online learning communities.					
Emma should be encouraged to engage in extra-curricular activities, e.g. in workshops or (online) communities, where she can learn what she wants and how she wants to learn it, in collaboration with other learners.					
Emma should be encouraged to participate in a volunteering activity where she learns to help other people and is encouraged to build up knowledge in a practical field.					

Space for your comments and ideas:

3. Inclusion

Chanta is a 6 year old Cambodian girl whose family has just emigrated to France. She does not speak a word of French and feels completely lost.

Please rate the following statements (1=strongly disagree - 5=strongly agree):

Chanta

Migration and cultural diversity in 2025	1	2	3	4	5
Since immigration is projected to increase, by 2025 most European countries will have implemented effective programmes supporting integration and socio-economic inclusion.					
In 2025, it will be normal for people to change their country of residence and the younger generation will naturally grow up speaking different languages and belonging to different cultures.					
Cultural awareness and inter-cultural communication will become an important subject in school education.					
Future challenges to equity and inclusion...					
By 2025, it has become normal for schools to provide support and training for pupils with insufficient language skills.					
In the future multicultural classrooms will have become the norm, thus requiring new strategies for teaching and learning in such settings.					
By 2025, schools will have realised what a rich learning resource students like Chanta are for their peers.					
In 2025, technological innovations will allow children like Chanta to continue studying their native language and culture, e.g. by attending a virtual classroom with other Cambodian French children.					
Future strategies for children like Chanta...					
Digital games and virtual worlds will help Chanta in the transition phase by simulating real life experiences in which she can train language, cultural and communication strategies.					
Learning programmes combining Khmer with French, written with spoken language, pictures with words, help Chanta learn French.					
In 2025 language skills have become less relevant due to improved, mobile and real-time translation technologies.					

Space for your comments and ideas:

A. Qualitative Online Discussion

1. Expert feedback on Frank: The role(s) of teachers and learners in 2025

1. This is a really interesting debate and discussion. The change of the role of the teacher in all aspects of teaching and learning is changing faster than many think. We are already seeing this in some of the work that we are doing around broadcasting in education. We use the term, "Subject Matter Expert", rather than teacher a lot of the time and we find this useful as it can refer to anyone with knowledge of an area; even the students. So SMEs can be in school, outside or anywhere. For a long time teachers have been considered to have to have a knowledge of everything around their subject; in some subjects that nearly impossible to ascertain and that is why they call on learning resources and other assets. So doesn't it make sense that courses in the future may be administered by a teacher but with technology resources and other SMEs contributing at various times. We also like the idea of "celebrity" being attached to SME; why shouldn't a really good teacher or SME become a well known celebrity figure internationally to learners and peers? They should be! Interestingly with some of the University Clients with whom we are engaged they are taking a step away from having video lecture content on demand but rather going to scheduled live broadcasts. There are several reasons for this but mostly to make sure students don't study and complete assignments just in time. But, also using the technologies that we are bringing across from broadcast there is no reason why that live lecture can't be in good quality to up to 2.5 Million people (could be 10 Million) simultaneously with 3-5 seconds delay. Couldn't this make education and accessibility possible for a lot more. Looking at the commercials to a University why wouldn't they want to charge subscriptions to large amounts of students all over the globe? If we turn to another technology solution we are using, its effectively an outside broadcast rucksack; its battery powered, connected to the net via 6 GSM modems, plug a camera in, press broadcast and the video hits a flash player on a web page in 6-10 seconds. So as long as you have enough mobile phone coverage you can be an SME to anyone who can watch. My conclusion would be that the teacher's role in the future will always be there to stitch a curriculum together, join up the knowledge that can come from a huge range of resources and personnel who are SMEs.

2. "Finally, demographic changes in the years before 2025 will reduce the number of teachers available for face-to-face teaching."

    One wonders… In ageing societies, with a low demographic pressure, and not-so-many roles for people for are not cutting-edge in their sector any more, we would inclined to expect an overabundance of teachers and would-be teachers in comparison with the number of pupils.

2.1 Reply
    I guess there will be plenty of retired teachers, but most would perhaps not be ready to return to their profession. Forecasts for the Dutch labour market for teachers (made in 2008 by the Ministry of Science and Education)assume from 2010 a shortage of 1100 FTE (or 3%) and more than 3000 (or 6%) in secondary education.

3. In a world where information is easy to acquire informational connoisseurship, the ability to tell the quality of information, is becoming increasingly important. This might be a key role for teachers and proto-professionals/SMEs – but as far as I know, we do not know how to teach it well yet, nor how to test it. Maybe Frank knows, maybe not.

    In a world where anybody can listen to the world's best (or at least, funniest or most prestigious) lecturer for free fewer will listen to the tenth best – or the really brilliant one only available through a pay-channel. Interactivity might be the real key issue: people learn best when they get feedback on what they are doing, not just by listening to good lecturers or teachers.

3.1 Reply: Information as such without connection to a domain of accepted and proven expertise, would you think this to be way people learn?
    Social and commercial abilities are for me not the only determinants of learning in the future. Sharing, socializing, putting to work the knowledge offered everywhere as 'information' will be a crucial factor, requiring insight in the core elements of expertise, as well as in the domain knowledge and structures. During development to adulthood, every young person needs coaches and experts, who show him or her how knowledge from a specific domain works, is

set to action. The teacher, needed for this, will be an expert in expertise transfer-coaching in stead off being a knowledge-transmitter.

4. Teachers will always be there! Where there is a student there will be a teacher.

    Perhaps what may change would be initially a teacher in a remote location and perhaps later a more "virtual" figure as a teacher.

    With internet and the mobile, taking the world by storm and being the "steam engine" n "electricity" of our generation, the world has already somersaulted several generations ahead, with sentences such as "Global Village" becoming a reality! We do however, need to get the whole world on the same page………

5. Hi,
    I have been arguing for over a decade that teaching will become multiprofessional in structure in a similar way to medicine with novel specialisms. I have various decks on the subject and I wrote about in my book "Personalisation of Learning in the 21st Century". It's a difficult topic and a long road to realisation.

    Thanks for stimulating the debate

5.1 Reply
    I'd love to hear more about the "novel specialisms" you are referring to!

    When looking for your book I found an interesting presentation you made. I take the liberty to post a link to the PowerPoint here.

    http://wsgfl.westsussex.gov.uk/ccm/cms-service/stream/asset/?asset_id=2892286&file=/Chris%20Yapp%20presentation.ppt

6. I think we need more hard data on what works and what doesn't. It's not about whether to use tech, but about how to use it and where to use it.

7. I would like to shift focus also on other aspects of learning instead of knowledge and content. Learning is also a lot about transfer of culture, learning norms and values and acceptable behaviour in specific situations. As Prof. Feurstein states: culture is key: it is like the underlying operating system of your computer. If the operating system is not good, no application software will be useful. So children have to learn their culture of course of their family but also during their formal education of their teachers. It's not only being able to apply knowledge learned via digital media but also apply it in a conscious way while living and learning together with other people. This also applies on workplace learning: content knowledge is the easiest part, skills a bit more difficult but also to be learned using new media. But when it comes to attitude I think the role of teacher is still necessary, maybe even more necessary then before. Think of learning to act respectfully to patients in healthcare situations, openness to ideas of others when working together on a project, creating a good atmosphere in a restaurant. I can imagine that some day technology can also help in learning these kinds of skills and attitudes but in my opinion it will still be an important part of the job of teachers in 2025.

8. The "control" will be lost when people understand that we all make part of a net where we can share knowledge. We will feel more integrated more responsible we will be a great family helping each other by exchanging knowledge, wherever you are. All human being are able to "build" knowledge, there will be laboratories instead of schools we will make our own choices. We will take "control" of our own knowledge.

    Tks

9. > "We believe that the teacher will lose the role as a gatekeeper to knowledge and instead become a guide for learners, helping them decide which learning path is most suitable for them."

    From my point of view – i.e., having chosen at the end of my PhD, secondary (and now primary) teaching, I could never imagine being a teacher "gatekeeper to knowledge." Similarly, I think around me, the vast majority of my colleagues consider themselves primarily as "guide for learners, helping [to] decide which path learning is most suitable." This, since long time, and whatever technology available.

    > "Some of their secondary activities, most notably assessment, will be conducted by other organisations than the school that they work for."

What assessment are we talking about?
If this is a final evaluation, aimed at measuring the ability of a pupil or a student who received some instruction to meet specific criteria – those of a company or an administration example, it is already largely done by non-school (administration tests, go to hiring …)
In the case of continuous assessment, I don't see any assessment the teachers are in charge themselves may disappear for good reason that the evaluation process is just continuous. It is part of learning. A teacher accompanying a learner is at any moment now evaluating its progress, challenges, strengths just to be able to help choose "the most suitable path".

If it's finally normative intermediaries evaluations (teaching period endnotes). Do not forget that their value in terms of learning has long been disputed. Do they not primarily a "discourse" that the school or university have equally if not more, toward society as pupils and students themselves. These assessments there could perhaps be removed from the burden of teachers (which of them would complain? -), But the main interest might be to restore its rightful place in this type of evaluation, that is to say I think a minor role!

> "Finally, demographic changes in the years before 2025 will reduce the number of teachers available for face-to-face teaching. This will lead to an increasing dependence on technology."

I guess we do talk about the situation in some developed countries – not particularly of France for example, whose population is not low. We also assume that European countries still remain cautious against the pressure of migration… . Do we also supposing that the rate of unemployment in countries where it is around 10% or more remain as high? Currently, with the grounds of fiscal consolidation, it removes the teaching positions with a vengeance. Yet, more than the result of economic or demographic determinism, isn't it primarily the consequence of policy choices, present … and past?

> "We also see some challenges ahead, in particular with regards to the deployment of technology in schools. There are still many open questions regarding the roles of the human teacher and technology in future learning processes."

Yes. Among other things, in primary and secondary at least it is not only to teach but to educate! In this context, it's not sufficient to meet the public to an interface, even interactive, with knowledge. I believe in the necessity of social confrontation with each of his fellows. Who will step to say that this is absolutely not useful/necessary for students?

> "Frank: « Why are young teachers so dependent and uncritical of the use of technology in their classroom? »
« Frank believes that teachers need to stop focusing on what technology can do, and concentrate on their role in the learning process. »"

Fortunately (?), my experience is that it is illusory to believe that we can conduct teaching in a classroom while only concerned that the contributions of technology. A young teacher who comes into the career, if he had in mind he's going to worry only that knowledge and manipulation interfaces, will, I think, in front of serious disappointments. For the simple reason that in a classroom, the first material with which a teacher must work long before the knowledge or technology is the human material. But I doubt that by 2025 technology gives us the tools really interesting to work on this here 😊

9.1   Reply: Thanks for the elaborate comments, really useful!

With regards to your comment: "Fortunately (?), my experience is that it is illusory to believe that we can conduct teaching in a classroom while only concerned that the contributions of technology". I completely agree that the human material is key, but not all teachers are well equipped to deal with that.

In some countries, teachers (especially younger teacher) depend to a large extent on learning methods that have been developed by publishers. These methods spell out what a lesson should look like, sometimes literally from moment to moment. From that, one could assume that technology could make such learning methods (or 'prescriptions' in some cases) even more determining in what, when and how is being taught.

Do you see any dangers attached to a dependence on technology in learning?

10.   Social comments and analytics for this post…

This post was mentioned on Twitter by mattinamsterdam: What are you thoughts on future roles of teachers? Join our discussion at http://ipg.ict.tno.nl/wordpress/forlic/discuss-the-future/...

11. Now, how can I myself consider the teaching profession in 15 years?

    Firstly, I must say that I believe I can only have a thought in the national context that I know, i.e. the French context.

    That said, the type of change that comes first to mind is not determined primarily by technology but by the political and economic choices.
    For almost ten years, the choice for National Education in France seem to have been guided by three goals corresponding to a certain vision that I would not hesitate to describe as ideological.
    On the one hand, successive governments on the pretext of the fight against budget deficits, have given direction as to reduce the magnitude of expenditure, notably by eliminating jobs by the thousands. It was "scouring the mammoth" (Claude Allegre).
    On the other hand, they have deliberately chosen to address what was perceived as a corporatist fortress: the body of the 800,000 teachers in secondary and primary with a strong structure, a common culture and identity. An objective, non-admit in major media, but sometimes trumpeted backstage was and still is to break the cohesion, to disconnect this body accused of blocking any attempt at reform.
    Finally, they have initiated a policy of deep transformation of the education system with slogans like "putting the knowledge at the centre" instead of "pupils at the centre" or "we must scan the legacy of May '68 ".

    All these choices, I believe, a direct impact in how to practice the teaching profession. The evolution of technology and the advent of new tools in the classroom are not on a neutral ground, but instead on a minefield where the voltage is constant and pervasive conflict. And I did not say anything about the changing behaviour of the pupils, or the cases of areas where, due to the social conditions, teaching is the most difficult.

    We should therefore consider several hypotheses to get an idea of what will be the job of a French "Frank" by 2025. Some extreme cases up to almost complete dismantling of public education, the atomization of the statutes and practices, the disappearance of class as a privileged place for the transmission of knowledge, or other emphasizing collective learning, solidarity and mutual support between the professional world of teaching as much as between pupils and students, Education finally, understood as the introduction to a "living together" and not just a " each one to find his path. "

12. I definitely agree that technology is an enabler, and that it cannot replace people and teaching skills. However, it is an important enabler. Once fully deployed, e-learning technology can permit remote students to acquire (parts of) their education from remote schools. This will have a very important social impact, positive in my opinion.

    Peer teaching, "*the distinction between professional and amateur teachers will blur*" – this is another important trend. In general, free agency as opposed to wage slavery will play a more and more important role in our society. In is important, I believe, to recognize and suitably compensate the work of part-time semi-professional teachers.

    Back to today's world, there is a potentially dangerous trend: citizens embrace new enabling technologies much faster than governments, and students embrace new enabling technologies much faster than schools and teachers. I believe administrations, schools and teachers should study and embrace emerging social networks and online collaborations environments, else they may quickly become de-facto irrelevant and leave everything in the greedy hands of corporations.

12.1 Reply: Great quote: "free agency as opposed to wage slavery will play a more and more important role in our society". You might be interested in the work of Benkler, see him at Ted.com http://blog.ted.com/2008/04/yochai_benkler_1.php or download his book (for free 🙂) at http://www.benkler.org

13. Reply: Do you have suggestions for research? I for one would be interested to see more research on education that uses the context of learners (e.g. augmented reality).

14. Great initiative and fantastic discussions!

    Back to [Nr 12]'s earlier point, I believe one of the most important trends today is the change in the way we – but mostly the young generation – communicate (technology being the enabler). Social media is a clear example but this is just the beginning of a major shift in social interactions. Young people embrace these changes but there is a risk that teachers and institutions are playing catch-up. Great recent example when a group of secondary school

students complained to the tutor about not receiving the course work data, etc. The reason? They are not using e-mail… but facebook (they created a project group on Facebook and expected all communication to be done there!)

Moreover, the internet created the world of NOW; instant information at the click of a button. Could teachers compete with this? Isn't there a risk for teachers to lose credibility? I guess this is where teachers' role as gatekeepers of information will have to change into a 'guide for learners'.

I've learned recently about 'the public school', a flexible model for (adult) learning, matching learners and their interests with teachers or subject experts. Not that big at the moment but nether the less, a great initiative + technology only enabling organising the classes but learning is still delivered in the traditional way (if interested you could check http://all.thepublicschool.org/).

One last thought: education in the context of globalisation and helping developing countries with their educational needs. Technology should enable free access to (good) education for everyone and governments and institutions should be the ones driving this forward!

I'll follow the discussions with great interest!

15. Tweets die vermelden Previous discussion: Role of teachers 2025 -- Topsy.com 3 months ago   Reply

[...] Dit blogartikel was vermeld op Twitter door Carol Skyring, octavian florisca. octavian florisca heeft gezegd: Discussing the role of teachers 2025 @ http://ipg.ict.tno.nl/wordpress/forlic/discuss-the-future/role-of-teachers/ [...]

16. Teachers as we know them will no longer exist. Print journalists are a disappearing breed. News readers on TV are a disappearing breed. Many researchers are normal people using Google and Wikipedia, and the expert researchers are being disintermediated. Map makers are going away because of GPS.

Look at instructors in Colleges who are being replaced by adjunct faculty and teaching assistants to the disadvantage of learners.

Much of the learning by youth and adults will no longer be done by the traditional stand and deliver teacher centric model of the past 600 to 3,000 years. Learning will be done with learner centric, web centric, self paced, interactive multi-media instruction available to youth, and institutions will make it available to adults.

17. I feel sympathy with Frank. If there will be any development in ICT, human skill of teachers will remain a key factor.

18. Just a quick example:

If a Medical Doctor of 1800s entered into as surgery room of 2010, he would not be able to do anything.

If a Teacher of 1800 was to teach a class in the year 2010, he would be able to do something, maybe not with IT, but he could teach "something".

SOMETHING IS BETTER THAN NOTHING.

W teachers of all ages around the world!

2. Expert feedback on Emma: The school of the future?

1. Emma reached her learning plateau within her high school?? Too late!
Why wasn't Emma challenged two years ago when her Spanish teacher noticed her uncommon interest in the Spanish language? Why did she have to stay in school while she could have done a learning module (any learning module) in Mexico, or participate in a Mexican school via telepresence?

1.1 Reply: …sometimes you are trapped in the structures and you may not know about alternatives or do not have the opportunity to use them (it is also still your parents and other grown-ups that decide…)

2. When was learning ever restricted to the boundaries of school? 😊

I guess what is changing is increased recognition of the learning that happens outside of schools – and more formal attempts to recognize that learning.

3. The involvement of a range of societal stakeholders in education is vital if we are to achieve the transformation we need in formal education. A research project I have been involved in for some time – http://www.eee-edexcel.com – has found that the connection between business and education, at every level, must be strengthened and, in fact, must become core to the objectives of every business big or small. In fact, businesses and other organisational stakeholders need to become owners and designers of education, not just the providers of experiential learning opportunities.

4. The School of the Future should not be limited to the "privileged" few…. we must see to it that it is available to all Students, realizing their potential to the fullest!

   In the world today there are still students who sit on the dirt floor, under a tree, write with twigs in the dirt! The real School of the Future should be good clean classrooms, educated Teachers and study material for all!

5. Our KSU online high school will is on the leading edge of a new education paradigm. We employ constructivist pedagogy which is student centric. It recognizes different learning styles and intelligences and focuses on accelerating individual learning with these styles in mind. This approach is referred to as "Just-In-Time" (JIT). Any time, any place. Because we use an open source LMS education platform it is available globally and affordable for all! As an example, I just completed an online course on microfinance to Kenyan students. They now have implemented a microfinance course in a remote village. Our theme: "Helping Africans to Help Themselves".

6. As part of a team, I am currently working on a new, immersive learning methodology for MBA students at the university I currently attend in Canada. (It's a class assignment but has garnered a lot of interest from the MBA faculty.) The idea is to let students develop their own learning experiences by linking them up with local and global companies online. Instead of the traditional case-based approach, students actually create their own cases, define contexts, make connections between a variety of subjects and exercise creative and innovative solutions development.

6.1 Reply: Great […], very interesting! Can we see it? If so, could you post a link?

7. The Waldorf/Steiner schools have been doing this for years, most notably with senior projects (which last all of senior year, and often part of junior year). Glad to see that others are catching on. 😊

   I am off not to watch some senior project presentations on our local Waldorf school, which my kids attend.

7.1 Reply:
The link I posted on senior projects in the Website box is hard to find, so here it is directly:
http://www.emersonwaldorf.org/high-school/senior-projects/

8. Many of these responses suggest programmes that leave the existing structures intact. Surely it has to go beyond this. I've been thinking for a while about a model whereby each child has a learning manager from the beginning of their primary phase. The LM would be responsible for deciding how to spend the credits or vouchers allocated annually to each child. Depending on the prevailing political or economic climate, these could be statutory funds from government or means tested against parental income. They could also include some private sponsorship. Initially, the LM would probably be a teacher or, in some instances, a carer or social services representative. Over time, other people – parents, the student themselves, sponsors – would have a say in how the credits are spent, with decisions made according to each child's specific cognitive needs, developmental progress, preferences and aspirations. In practice, for example, a 15 year old might 'buy' drama, humanities and English Lit lessons from her local school (1), business and economics programmes from her local bank (2), courses in the sciences and maths from the local university (3), and sports from a local private school (4). The state would fund 1 and part fund (along with her parents) 3, she would be means tested and offered a scholarship for 2, and given a bursary by the National Lottery for 4, having shown great promise at athletics.

This is just a summary of a work in progress, but I'm interested in people's thoughts.

9. What about values that schools nowadays and tomorrow ought to realize, implement, and follow in practice? There are good reasons why sustainability ought to be an integrating value, covering truth, wisdom, beauty and good.
We live in times of rapid climate change, overpopulation, degrading natural environment, decreasing biodiversity, impoverished ecosystem services, decreasing rain forests etc. There is urgent need to learn about real problems of the real world, about sustainable use of biosphere, about biodiversity, identification of species and ecosystems, how to best protect them. An excellent learning tool to promote species identification and sustainable use of biodiversity is NatureGate Online Service: http://www.naturegate.net and http://www.iucn.org/about/union/commissions/cec/?2614/

10. Learning is a natural state of the human condition. Schooling was invented to assist the process but also it was invented and further developed to manage youth.
Learning to manage boredom is one of the key aspects of managing youth. We have known this for a long time (see Willis P "Learning to Labour").
It is always important to keep in mind that learning and schooling are two totally different sorts of activities. You can blame schools for making kids bored – its part of their raison d'etre.

11. The problem we should ask ourselves is: how to get the natural state of learning into the 'classroom'. In this example, Emma should be challenged a long time ago even before she got bored. Recognizing this is something nowadays a teacher should do. In the future students can make their own way in their natural state of learning. That is not limited to a school and could happen anywhere at any time.

On the other hand, will the students be able to cope with that kind of freedom? Is their internal motivation enough or should they be stimulated to reach the next level? So I think the ideal picture would be a system or surrounding in which students can learn in their own way, but still have to obtain the competences they need in live and be stimulated to do that. It's also important that we don't forget the power of social learning. To learn from each other is often more powerful then to be told by a teacher.

12. The natural state of learning, that is self-directed, self-motivated learning, or learning through play, cannot be "established" top down into a class-room. We have to accept that the curriculum driven approach to general compulsory schooling will simply not work in a paradigm that sees people as intrinsically motivated beings. It is only in later studies, that have been self chosen, that we can set fixed goals.

I will try to publish all the relevant data onto my website
shortly: a historical overview over paradigms in schooling,
recent innovations, and empirical research to the effect of self-directed learning in a freedom based environment. Because most of it will be in Dutch, but is largely derived from other English sources I will include these as links.
For as know, the aero website provides a good start:
http://www.educationrevolution.org/research.html

12.1 Reply:
see also me reaction the post below [13.1]

13. I think that institutionalizing learning goes hand in hand with more decentralized and free approaches to learning, such as online communities of practice and networked learning. After a while, both approaches will have their own merits. Learners will be free to choose their own approach, which means that some learners are happy finding their own way online and learning with peers. Others might find comfort in standardized curricula and tests. The latter, more traditional learning system, is trusted widely in our society, but is an inflexible and expensive approach to learning. It encourages more passive learning, because learning is organized by an institution. This means that the motivation to know the stuff offered by an institution does not come from the learner but emerges from a system in which the learner is not really involved.

Because in such a system, the learner is not supposed to be motivated enough to learn, standardized tests and exams are needed, otherwise how would you ensure their participation and effort? In more open and free learning activities, motivation to know something is key to

learning, rather than motivation to get a degree. That's why tests and exams are considered more like instruments for a learner to assess his/her own learning, than an institutional tool to maintain learner participation.

Any alternative to this system should consider how learners are evaluated if not by standardized tests, and what would drive their motivation if not a degree based on these tests. What is the role of their peers? What about their online and offline activities? Their role and contributions in different communities?

I try to find answers to these questions. Anyone interested in my research on learner reputation in online communities, or if you think you can help me with data or projects, please send me an email at t.a.hennis tudelft nl

13.1 Reply: I think the work of Carl Rogers, Deci & Ryan shows to some extend that external evaluation is opposite to self-directed learning but that this not need be a problem for motivation:
"Research by University of Rochester psychology professors Ed Deci and Richard Ryan into human motivation and the concept of autonomy provides a great deal of data relevant to freedom-based education. In comparison with controlling environments, the research has found that autonomy-supportive environments – characterized by respect for students and student choice – are associated with greater conceptual learning (Vansteenkiste et al., 2004), higher levels of creativity (Koestner et al., 1984), greater self-determined learning (Grolnick et al., 1991), and higher levels of intrinsically motivated behaviours (Deci & Ryan, 1985). The research also indicates that humans have an innate need to be autonomous, to feel a sense of control and self-governance over one's actions (Deci & Flaste, 1995)."
Comparative Study of Conventional and Freedom-Based Schools Researcher: Dana Bennis, 2006

14. The emerging knowledge acquisition model is a learner centric model which uses web based, self paced, interactive multi-media instruction. The material will be designed, implemented and enhanced by a combination of experts in cross curricula content design, effective learning design, appropriate assessment (pre, concurrent and post) design and experts in implementation and enhancement. Outstanding models of this approach to learning have existed in the US for over 25 years.

The protection of unionized adult jobs has hindered the acceptance of a learner centric model which uses web centric, self paced, interactive multi-media instruction, assessment and implementation. This approach will be the primary learning system used for both youth and adult learning by 2018 to 2025.

The explosion of information and knowledge requires a totally new paradigm to enable youth and adults to maintain their economic well being and to increase their competence to earn more. If not the US, then Korea, India or Singapore will develop the learning materials which will then be priced about $25 to $50 per course. Parents, guardians, Community Based Organizations and NGOs will make learning material which uses web centric, self paced, interactive multi-media instruction available to youth, and institutions will make it available to adults.

15. I think the motivation of the person to learn will be the key factor in 2025. If there is no obstacle or a very low barrier, the most important thing is a will of the person. Sometimes the motivation is lost when one's environment is too rich.

16. People want to be free to choose what to study, to express their passions. This already happens to those involved in connectivist learning. It will need people/teachers to help them in their choices and to guide students into courses consistent but respectful of their desire.

3. Expert feedback on Chanta: Inclusion

1. One reason that collective learning is not emerging (yet) in broader sense is that individual players in society see only their own benefit.

Therefore knowledge is undisclosed and kept as the source for earning money and selling "wisdom". As soon as the knowledge is more widespread and people understand it then the

interesting phenomenon of reframing and creating a new "language" for the already well-known field comes up.

As soon as new words are used for tools, principles and similar knowledgeable groups are diverted.

One way to overcome this is by focusing much stronger on the recognition of patterns in economic and social developments instead of focusing on number, variables and techniques.

Jay W. Forrester back in the 90's already promoted to introduce system dynamics much more in education (from kindergarten up to university). There is an opensource course on that even available on http://systemdynamics.org/wiki (called Road Maps).

Looking forward to hearing from other interested parties in it (also in translating the English course into other languages like Spanish, Greek, German, Finnish or others)

2.   I have noticed that collective learning is a very difficult concept to understand in many cultures. I agree that there is a tendency that more individual skills and knowledge is emphasised. Actually very few information is produced individually from the beginning.

There needs to be very holistic understanding about learning in order to allow individualised learning in collective settings. Perhaps, the aim is best described as dialogue between individual and collective learning. " I learn when we learn". (= core of Inclusive policies)

3.   Discussing the future of learning is to have sense about a macro learning point of view. Siemens refer it a National Level http://www.connectivism.ca/?p=249 and we are observing about it at an European level. Barriers? Difficulties? Challenges, for sure and great probabilities for errors. A problematic also guided by Masie at http://www.masie.com/Learning-and-Government/overview.htm.

The studies from IPTS/JRC showed us, clearly, that the future of learning makes serious demands on inclusion.
Most of the researchers and titles I read last weeks also focus on the importance of having more investment in order to challenge USA and Japan innovation advance.
I will point out also the following: we need to cement at our knowledge agents the idea that money is not the answer, but spending it efficiently, yes that's central. Talk is about moral, ethical, but also more management from knowledge agents. And learning leadership, that's for sure a big challenge to assume. Learning in Europe as to face the reality that each individual is different and so must be our solutions for it (especially when we consider all that "paraphernalia" of IT stuff, that we don't use efficiently). Equality and Inclusion comes from it as a consequence and a result. If we put it at the Top Level of our concerns on Learning we probably are missing the Challenge, just before entering at the field to play the game. And the

4.   By accident I crossed this page having no background like collective learning etc but like to state my immediate thought when I looked at this scenario.

1) Language: Why is there not a portal where everybody can find basic courses to learn: my language > to English > and to the country language I have moved to?
English because it is the common business language at least the kids lean it more and more even starting kindergarten. So this is the fall back language if you do not find the right expression in the country language.
example : Greek > English > German for a greek guy who has moved to Germany.
Basic equipment is a computer (audio and visual capability) which is no more expensive like years ago

This portal should support a community having all other learners by age and my country so you have the ability to build a network between people facing the similar situation, problem to resolve.

The portal should support a plan how to achieve most quick the language to learn. So there should be something like chapters / lessons to learn till then and a test after each to track progress.
Further enhancement could be to have kind of mentors you can contact or answering question & answers, you could organize form time to time sessions you can call in and share certain topics etc…

With this everybody at least has the same chance independent from money, time, available school or support in the home location to learn by yourself. And also to build a network with

others so a chance to 'help yourself'. This even in advance before you move to another country.

2) attending school: why does this girl needs to go immediate to school when she cannot talk a word at all? This is frustrating. Why not to say for one year you learn guided the language and important school subjects via e-learning where people join across the country having the same situation? For sure you loose one year and for sure you have more effort but this is when you move across the world.
Chanti could participate after i.e. 6 month in the local school step by step in certain subject like sports, mathematics…to go into the new local environment, exercising language and phasing in the school matters and repeats the year.

Important is to know where to go to, to have a plan and stick to this plan and step by step build a network. This is what is to be provided not only in the case of children also for adults. In case of children for sure at least one of the parents should monitor and participate in the language learning exercise but this it is.

These are my simple immediate thoughts.

5. The issue of inclusion goes far beyond language (although language is clearly critical). It relates more profoundly to culture. The challenge of inter-cultural learning is important within this context. Even if you have the language (which, in fact, many immigrants do) that does not mean that you will be either culturally accepted by your peers or that you will feel comfortable joining a new culture. At the moment, culture is often cited as a barrier to learning – non-native cultures are issues to be managed within the classroom. We need to move education more towards a point where a classroom where cultures are mixed is embraced, celebrated and seen as an opportunity, not a problem. This requires strong and principled political leadership at one end but also greater openness and flexibility amongst educators at the other.

6. Education, navigated by the individual interests is the counter-side to traditional compulsory education. This presupposes learning to learn abilities. For everybody, missing initial learning to learn abilities, additional coaching and supervising should be provided. This will prevent that specific groups and persons will not be able to selfdirect learning. A certain amount of coaching or guiding in study choices during and after initial education could also prevent that we on a certain moment will have no mathematicians, because mathematics is not nice, difficult and has nothing trendy.

    And what about the famous words of Prof. Jaap Dronkers, sociologist of education, now in Maastricht University, in discussion on formal learning canon: '…it is better to acquire the French language, than learning to cook'……?

7. Yesterday Morning: Session 4 of the Freedom Forum on Education (www.liberdade-educacao.org.) in GUlbenkian Foundation in Lisboa.

    A 5 stars guest (Mona Mourshed-researcher at McKinsey who made a report on educational outcomes in the U.S. Why McKinsey is investing in research of this nature? Why and for what? If you read feel, that makes sense (Mona writes about key economic indicators) as now educational matters and can not be dissociated from any business with significant effects of upstream and downstream). Money for no use to serve or money for anything to be achieved? How to change this paradigm in education.?

    Some briefings to sharpen our thoughts:
    The % of students enrolled in higher education whose father is educated (29%) is more than triple the % of men of the same age (40/60 years) with higher education (9%).
    In Portugal, as in any other European country, have a licensed parent is still the form of guaranteed access to university – a student with a licensed parent has more than twice as likely to arrive at the university, that a student whose father is training higher.
    A child under 4 years in regular contact with people of advanced vocabulary, appropriates a hundred times more words than another, without literacy.
    To have great education requires great teachers! (The McKinsey report states that: – reduce the number of students in a class does not have any results in the better learning). Mona gives 4 Lessons Learned:
    1. Lesson 1 – Quality of Teachers
    2. Lesson 2 – Quality of Instruction
    3. Lesson 3 – Every child succeeded to be
    4. Lesson 4 – Schools need great Leaders.

MY Questions:
Resulting from lesson learned 3 education in Europe is inclusive. However coming from the report results can only be better if we have elites in school (Leaders and Teachers). Is that irreconcilable?
Which the role of technology in the territories of education, if the report is concluding that investment in technology in schools is of no significance for better learning?

8.   The number one priority of immigrants is to learn the native language of the country they choose to enter. The native language enables them to understand their new community and be accepted by it more quickly, and to more rapidly learn the other academic subjects thoroughly and quickly.

   The current learning systems are designed and staffed by native speakers. Any efforts to teach in a foreign language materially reduce the effectiveness of teachers who are required to learn multiple languages in order to communicate with immigrant children. It materially reduces the effectiveness and efficiency of the teacher which retards the learning of the native speakers also.

   Young people have a facility to learn languages quickly. The history of successful immigration shows that immigrants who learn the native language of their chosen country to be more comfortable in their new community and more successful as learners.

B. Survey I: Reflection and consolidation of initial findings

1. THE ROLE OF TEACHERS
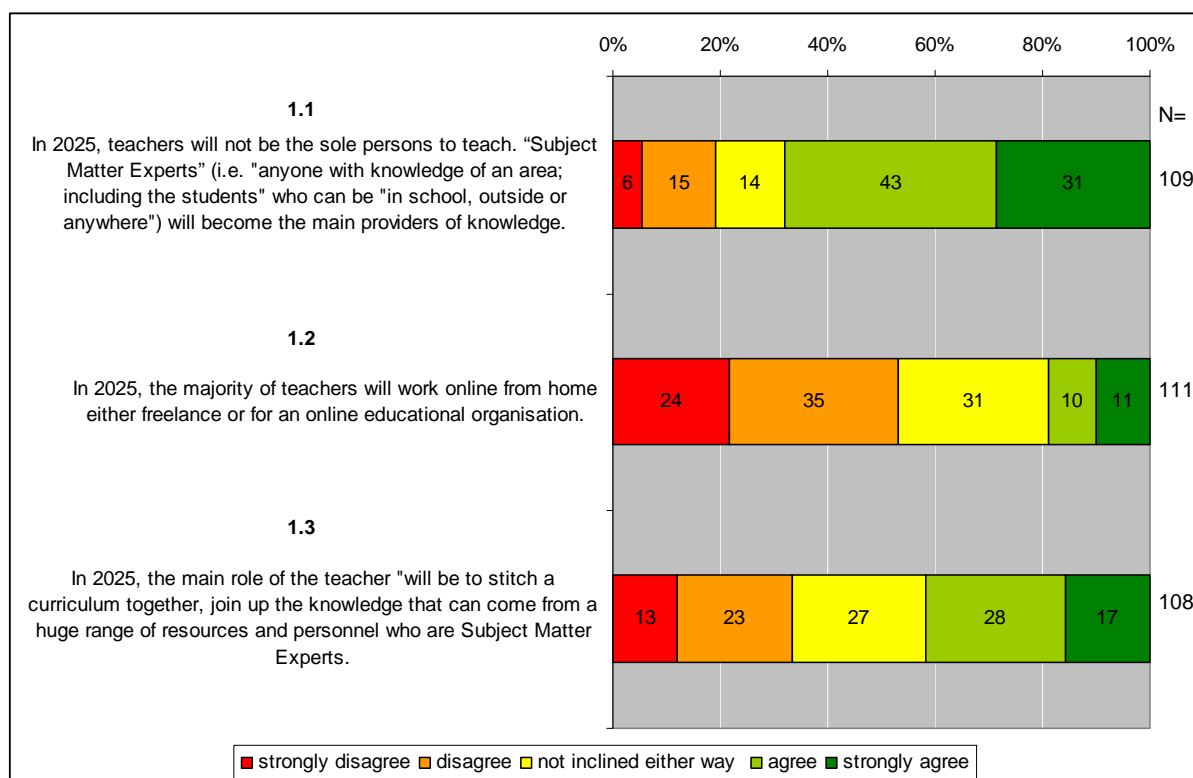
Figure 15: Results of online consultation (part I) on the future role of teachers (in absolute numbers)

1.1 Comments to the first statement

> *"In 2025, teachers will not be the sole persons to teach. "Subject Matter Experts" (i.e. "anyone with knowledge of an area; including the students" who can be "in school, outside or anywhere") will become the main providers of knowledge."*

Comments by those who strongly agree

- They will help learners understand and not merely transmit.

- The role of the teacher will be more a kind of 'role model' for the student. The reflections of the student, their own experiences and the teacher or fellow students as example will make the student learn.

- It's a much abused term, but we need to create a role for the teacher as facilitator or director of student learning, directing students to subject matter experts or experiences that will teach them in context.

- Nowadays the teacher isn't already the sole person to teach. Students are surprising them with information collected or knowledge appropriated at informal territories and bringing them into the classroom.
  The role of the teacher will be like a medical doctor, activating the learning commands of motivation.

- More learning expert, learning facilitator.

- I believe teacher will become a knowledge producer, using the standard applications and platforms and giving access to it, on demand, according to kids' skills and needs.

- The teacher will help students learn how to discriminate among sources for accuracy and import. They will also help students learn how to synthesize information from disparate sources.

- The teacher will mainly organize and facilitate the learning process and monitor the progress.

- Teacher and pupils will become dialogical learners. They will interact on egalitarian basis, and the teacher by especially selected by pupils for their passion or their ability to deepen understanding

- Teacher will become a term for anyone who facilitates the teaching process: formal teacher or professor, business person, expert, peer, etc. Teachers may also be artificial intelligence and software programmes who facilitate learning.

- The relationship between "the extended teacher" and the learner might be more of a peer-to-peer nature, and the "teaching process" might be more of the nature of sharing information, exchanging and continuous advancing in knowledge than of a static top-down teaching process.

- The teacher will become a mentor and a subject expert. As mentor, he should be able to give directions to students, to help them plan for learning and find the best sources for education. As subject expert, he will provide specialist knowledge to a wide range of learners (diversity of people, ranging from students to older people looking for improving their knowledge in a particular area or learning a new skill; non-location specific - people could have access to the teacher from anywhere on this planet)

- Orchestrating activities and provide the environment for the students to shine

- Teachers become facilitators, advisors, counsellors, etc.

- The teacher will be just a facilitator who can help and advice but there will be also pupils who are maybe more experienced in special subjects than the teacher.

- Will teach how to teach. Serve more as a moderator between subjects then an expert.

- Put that in 2075...

- I think teachers will move more explicitly towards the learning facilitation role - often raised at the moment but seldom realised since the current teaching body is locked into their own learning model of expert/novice roles. However, for the shift to occur it is not just teachers' attitudes that need to change but the ways in which they are trained and the whole nature of the school environment in order to make learning a less exclusive activity to time and place.

- Sharing of knowledge and collaboration in authentic learning environments will become the norm for future education.

- I think teachers will follow students to find their knowledge paths. Teachers, also, will make care to the real world, not only the school contents.

- Teacher will be a manager.

- El profesor(a) tendrá que ser especialista en métodos de trabajo para optimizar los recursos de las tecnologias y también debe ser el promotor de la exploración de nuevas ideas y apoyar a los estudiantes motivandolos a transformar estas en proyectos concretos. Es un guia positivo para crear nuevas situaciones de aprendizaje tanto colectivo como individual. Una relación mucho más cercana con los estudiantes entregando valores de respeto y confianza.

- TEACHER WILL BECAME AN ADVISOR

- 1. By guiding students to LLL
  2. By facilitating them to join the real market-life in the community in a role of the subject matter they choose.
  3. By teaching them critical along with technology skills and showing them their way to the real world of expertise.

- Less teaching, more providing support while students learn

- Teacher will become guides in learning worlds and to "Subject Matter Experts"

- teacher will become a facilitator enabling learners to learn

- Teachers should be facilitators of knowledge sharing and creators of learning situations, where other actors can be actively providing their input into education of students. They should also mentoring learners from an emotional and psychological support point of view. "Anywhere" is a challenging but necessary condition to develop further.

- Conduit for learning between students and subject matter experts.

- In many cases these experts are already the main providers, but they are not recognised as teachers for the moment.

- I think 'subject matter expert' is an interesting new name for teaching - I think the old authoritarian idea will take new form, but that it will become more merit based, as a result of more transparent modes of assessing someone capacity to teach - teachers on the one hand will become the collectors of inspiring examples that others have made (we now have TED.com, how are we (teachers) with our presenting skills, supposed to top that?! also, they will become 'learners' more - as our definitions of what constitutes learning may change radically.

- The teacher will be more connected to others (pupils, colleagues) than he or she is now. Therefore he/she will tune in more on the necessary input. Now he/she does a programme.

- The teacher will be more of a coach

- SMEs will be the main providers of knowledge, and in a sense they have been always. This does not automatically imply that they will "teach" in the sense we use the verb today. So I agree, but have some problems with the definitions.

- I don't think the role of a *good* teacher will change that much. The notion of a teacher withholding information and drip feeding it at their pace is already outmoded. The rise of the internet means that an interested student can gain access to information without the need for a teacher. Good teachers need to equip learners with the skills and attributes of the expert learner: they should enable students to find out for themselves, and critically evaluate sources of information in order to construct their own understanding of a topic. The ability to 'learn, unlearn and relearn'. A teacher will need to be an expert of 'how people learn' rather than a specialist in a particular topic: setting up a learning environment (which can be virtual or physical) and bringing in expertise - stretching themselves and their learners potentially way beyond the knowledge-comfort-zone of their own specialism.

- Schools and teachers will act as learning navigators, coaching the learning process and 'learning career'.

- Keeping an eye on the integration of the different streams of knowledge, asking critical questions on their relative value, facilitating the combined use of them

- Teacher will do more coordinating and vetting of learning materials and will be more like research assistants / movie directors in their classes. It'll become increasingly important that teachers stay up-to-date with all of the latest/emerging information and technology in all areas of study too, so 'un-learning' will become important as well (i.e. telling the students about the 'wrong' things they have been taught previously).

- The teacher will have a more coach-like task/role. I guess it will not take till 2025 but we see this happening already. Teaching and learning will more and more take place in complex networked arrangements

- More quality
  More research
  More condivision

- Major move towards creative curriculum planning for teams to deliver and individual mentoring and marking/testing online

- The teacher's role will be more of an instructor. Teaching and learning will become more mobile and flexible. We will not be bound by time and space. However, I feel that some kind of supervision and a leading tutor's role is necessary.

- The teacher will be able to make better use of the only technologies to interact with the students. In particular a course will include both an off-line and online dimension (blended learning).

- I think the role of the teacher as the person in class will change, really due to the development of software in which students can get information which is as good as the information they can get from teachers.

- I think, teachers have never been the "sole persons to teach" - peer teaching and informal learning have always existed. The main change I see is that with the wide availability and variety of sources of knowledge, this fact is becoming more apparent and is starting to be

acknowledged by society. The main change (and challenge) for the future will be how to integrate all these sources into formal learning in such a way that learners receive optimal support and assistance. In this respect teachers will become even more important than they were back in the old times when they could still control knowledge dissemination. However, their role will not be to "provide knowledge" but rather to break it in digestible pieces tailored at individual student's needs and to advise on learning strategies and course choices.

- I think the teacher will become more and more a moderator helping learners building their knowledge by merging, interpreting, mashing up broad and heterogeneous sources of information. Among them, not only SMEs but also peers, who had access to their own mash-up sources.

- Teachers are not even nowadays the sole source of knowledge - but unfortunately this is having bad effects on the recognition and status of their work.

  Role of teachers in 2025: baby-sitters, entertainers, social-workers (as today) but on top: mediators of knowledge

- Teachers will be more than nowadays facilitators to assist in getting access to relevant sources of communication and adviser.

- The problem is certification of learning experiences when they are ad hoc....

- There is a growing understanding that the classic view of intelligence is narrow and self limiting and that other areas of intelligence provide as much if not more value to society. This will lead to people other than 'academics' being seen as teachers for the future.

- The teacher is going to be more and more a "tutor", someone that guides students
  - to focus on their skills, attitudes, interests,
  - to learn how to get information
  - to learn how to use that information

- More like a mentor or coach, than teaching skills.

- The role of the teacher will be to share information, knowledge and wisdom. The teachers that come from the business world will have a huge influence on those studying as they are considered to have direct experience.

- Main role of teacher will be to guide the learning, to help learner.

- The roles of a teacher will change significantly to an adviser, counsellor and a guide because knowledge will be too 'common' that he (teacher) may be ignorant in many areas that his student is very vast in knowledge

- Supporting co-creation models, more collaborative processes and community-based project assessments producing learning outcomes rather than consuming them.
  I have problems with the title Subject Matter Experts as that is only an element of what is required. Learning to learn skills required as well.

- The teachers will be part of the learning communities but their role will be different. They will be no longer the central figure in the teaching process.

- The teachers will become more of an learning coach, Information can be received from in or outside the classroom, the teachers aren't any longer the supposedly sole proprietors of knowledge

- Provider of knowledge; filter of information

- A teacher will remain an important guide for children but as digital materials mature, the input of external media (besides the traditional books) will be much bigger. Communication with the outside world will change dramatically so that professionals including parents (also being subject matter experts in their own fields) will have a much larger role than now.

- Teachers will also have to provide guidance of different forms (career, emotional). The profession will be more multi-disciplinary

- Less generalist more specialist

- A teacher's role will (or should) evolve from content provider to content guidance. The focus on learning should increase, bypassing current delivery focused structures - and the learning will be more based upon capturing the informal than recording the explicit. With the increased availability of content (explicit) the actual value of implicit increases. The teacher's

role will be more to refer SMEs and to create the context that helps students to learn.

- When speaking of teaching, I think we are referring to someone who provides guidance, inspiration and support to learners. Often these people are trained to do this (having learnt about pedagogy, etc).
  When talking about knowledgeable people, we are referring less to teachers, per se, and more to experts who share their knowledge.
  There is a subtle but important difference.

Comments by those who are not inclined either way

- For the best students in the elite schools this may well be true. However most students will not be able to afford, or take advantage of this type of education. Their experiences in their preschool lives will have shaped them in ways that will make it difficult for them to work independently, without supervision and feedback. For these students the teacher will continue to serve as a substitute parent, as they do now.

- I see increasing opportunities for subject matter experts in and outside the school. But do not think they should become the MAIN providers of knowledge.

  There will remain a need for human filters (teachers) that guarantee quality, standards, a degree of objectivity, balance, universality etc.

- Subject matter experts don't necessarily know how to teach, they will play an important role in education but not a dominant one.

- I tend to think that the situation will be very varied depending on the type and level of education and on the country and system. Though the vocational sector and HE may indeed open up more to outside expertise, it is difficult at the moment (this is only 15 years away) to see the general education systems opening to that extent and one can expect a lot of resistance. In addition there is also the issue of how curricula will be structured - around competences and cross-curricula comps or subject based and the balance. This will indeed affect the different role of "teachers". Finally the role of teachers will /should be determined by the purpose of education. If it is so that all children/young people/adults can realise their full and unique potential, then this implies a lot of reflection about the organisation of school, the criteria on which teachers will be selected, their education, etc.

- I think that pedagogical knowledge plays vital role in training techniques in the future too. It probably will be even more strongly emphasized, when the responsibility shifts towards the learner. How keep him aroused and active, will be the issue.

- I partially agree. However the teacher could have double role teacher/moderator

- Não concordo, porque já actualmente o professor recorre a outras pessoas e às diversas tecnologias disponíveis para que o ensino seja mais completo e motivador.
  Portanto não é só em 2025.

- Yes. The teachers :
  - should become self-reflective researchers
  - will have surely high technology supports
  - will collaborate with many professional figures

- I find this question not answerable. My definition of a teacher is "anyone who teaches". I would rather say that the definition of a teacher changes from an institutional arrangement to a role that anyone can assume. These roles sometimes are merit-based.

Comments by those who disagree

- I think unions (especially in the US) are too strong to have teachers' roles change in any significant way, even if it would mean that it's better for student learning.

  However, I do think that learning environments will change -- I think more academic learning will take place in after school centres. I also think there will be a continued move toward homeschooling. These trends are beginning to take shape now.

- I don't think people who are not teachers will be the main part of the formal education process. Informally - sure, but that's always the case - people learn through their experiences.

- This will be less true in elementary levels and truer in secondary school/high school.

- In the role of a teacher there is a component of authority, of being a point of reference as well as of confrontation, of morality etc. which goes beyond knowledge and which is as much important as the contents to allow learning.

- By one, teachers are not the only ones to teach, already.
  But on the other hand, they are the majority, particularly in primary and secondary, and things change slowly.

- I don't think the 'newcomers' will be the "main providers" but yes I think they will be partial providers

- El profesor tendra la gran responsabilidad de guiar, y orientar, crear un escenario de aprendizaje nada màs

<div style="background-color:red; color:white; text-align:center; font-weight:bold">Comments by those who strongly disagree</div>

- I do not agree as great teachers are persons who are subject matters experts AND have the skill to transfer their knowledge and experience to others and/or facilitate the learning process in other ways.

- Main providers need to have qualifications and experience, I think, rather than just reputation or availability. So I don't like the idea of 'anyone with knowledge'.

- The teacher - student relation is as old as Rome if not older. People have and always will learn from the Teachers among us. I can not agree with the statement which is quite dubious I must say.

- The teacher's role will be more like a hub, receiving and distributing information

- Bildung is die Ressource der europäischen Wirtschaft. Breits heute versucht man aus Kostengründen und wegen Lehrermangels, ausgebildetes Lehrpersonal durch Studenten und Quereinsteiger zu ersetzen. Die Ergebnisse sind nicht gut. Will man Qualität erhalten, muss auch Lehrtätigkeit weiterhin von Fachleuten mit pädagogischer Ausbildung geleistet werden.

- Knowledge is the outcome of activity and engagement not simply a product that is 'packaged' and 'provided'

1.2 Comments to the second statement

> *"In 2025, the majority of teachers will work online from home either freelance or for an online educational organisation."*

<div style="background-color:green; color:white; text-align:center; font-weight:bold">Comments by those who strongly agree</div>

- Learning will in general be provided on line, being available to everyone that is interested in the subject. Technology and the Internet will make this possible, although adoption might be slow and hence, in 2025 there might be only a minority of teachers working remotely. Video conferencing, webinars, avatars (i.e. second life) and other communication tools would make this remote learning not only possible but enjoyable and efficient.

- knowledge will be deployed in may ways, but mainly by Internet. Teacher will be a manager of learning and naturaly he must be able to work online and everywhere.

- Mobile learning, e-learning, distance tuition and distance work are highly topical today, and certainly common in 2025.

- Internet will become the most convenient place to learn and there is a convergence of humanity not just learners in the Internet.

- This is already happening. Virtual learning is growing in popularity across the globe. This makes for more flexible learning hours more tailored to students circadian rythms.

- Logical end-point of different trends.

- I substain the e-Learning value

- The presence of the teachers will be predominantly online for long life learning, but still present in traditional school especially for children.

- ICT and distant learning will be much more than today, but face-to-face will be still necessary, precisely for all the socially related skills and competences

- Because I think most people will work in this way - as freelancers or independent consultants for organisations, who will buy in those skills as and when they need them.

- Insofar as online becomes increasingly reliable and teachers are able to construct audiovisual learning experiences which they will want to market and copyright for themselves.

- I think this could be true for secondary schools.
  teachers will work more and more from their own PLE (personal learning environment)

- Teachers will have to work according to new tecnology.

- Let's hope so. This requires a different, more free education system, where people seek for knowledge rather than be presented with chunks of knowledge.

- Education will take two forms: 1) cheap bulk on-line education for the masses, 2) expensive on campus education for the elite, the 10% with the highest SES.

- Teachter could work online.. But I still think dat being with a person in the same room, so can really make contact with someone is much more effective then online.

- I agree that the majority of teachers will work online (for some countries will be a huge challenge!) but still and mainly in state educational institutions that will use online resources. Part of their time (plus than 50%?) will be in the School territory (playground, working groups, dynamics, plays, social eevnts, sport events, etc.)

- Both will play a role; online and technology are full implemented.

- well... not in all subjects. Specially in the C&T area there will be the need to use resources of a cientific organisation (it is possible but not feasible/affordable to place cientific resources in each teacher home..)

- Expect this will be a combination. Besides, enabling technological solutions will be available but I expect it will take more than app. 15 years to change behaviour

- I think that because of the strong divergance in learning, e-learning will facilitate small schools with teachers for rare subjects. On the other hand I think that community learning and learning by doing will become the norm, and that this asks for high staff ratios, typically 1 to 10

- I think that a combination of face-to-face and on-line processes will co-exist. The importance (share) of each communication channel might depend on the nature of the subject taught and the age of the learner.

- all of the above including face-2-face classroom teaching

- I'm not sure if this will happen because I think that the face-to-face interaction, that means teacher-pupils, should also keep important.

- On line education will be accepted but face to face collaboration and teaching will still exist. People are social animals.

- Creo que seguramente la educación online ocupará un gran espacio del tiempo de los profesores, sin embargo pienso que también el trabajo experiencial físico desarrolla otras capacidades y habilidades que no pueden ser reemplazadas por las tecnologias.

- Online work will be important, but in certain situations, there is definitely an additional value to direct face-to-face contacts

- I think it is not either / or. There will a mix of real and virtual communities. and by 2025 there will all kinds of settings that we cannot foresee as of now.

- In times, the knowledge of human kind has grown not only because of what has been read on the book, but mainly (and I stress mainly) thanks to direct exchange of experiences and thoughts

- It depends on which sector. For PO I think it's important for children to have that experience with teachers, also for the future, with jobs. For WO I think that this will be a very valid statement.

- I think online teaching will grow highly next 15 years, but traditional teaching won't dissapear. The "presential" learning experience with a good teacher it's not easy to transfer to a virtual environment.

- a blended learning approach will permeate all work and teaching oportuities. the need for face to face interaction will grow as online/ web based tools become faster. we will crave human interaction

- Face-to- face interaction will still be important, especially for younger students and kids.

- Although I believe that the majority of jobs in the future will be home-based, I would like to think that there will be face-to-face meetings as social interaction is not to be taken lightly.

- Life contact will remain important.

- No, this represent a simplistic extrapolation of trends with a focus on cost-efficiencies. Learning works best socially, so self-organised learning groups might find teachers (I prefer learning brokers) to support their learning and identify accreditation strategies

- All institutions will become online, but I doubt that pure online will become the major form. So, while the majority of teachers will work online, it is similar as to have said, 15 years ago, that the majority of teachers would work with computers. The freelance and the online educational organisations are far more difficult to predict.

- I hope not.
  Yes there will be teachers who comment, discuss, mark work from students. But human face to face contact and interaction remains very important.
  There might be differences in this respect between primary and secundary education, universities and vocational training.

- In some cases yes, but the real socially shared learning situations will have their unbeatable advantages even in the future too.

- Não concordo. Todos estes meios ajudam o professor, mas não o substituem e uma aula presencial é sempre melhor pois promove também o convívio social.

- A good number of teachers, in industrialized countries, already work regularly online. But this is not an exclusive and I don't think it will become the next 15 years. The classroom will not disappear so quickly.

- Blended learning is possible in some circustances and some areas not everywhere

- Sicherlich wird die DV verstärkt einen Platz in der Ausbildung finden. Reine Online-Veranstaltungen sparen zwar Geld, vernachlässigen aber Schlüsselqualifikationen, die von Unternehmen dringend angefragt werden: Teamfähigkeit, Konfliktfähigkeit und kulturelle Kompetenz. Der Aufbau dieser Fähigkeiten erfordern reale soziale Kontakte.

Comments by those who disagree

- It depends on how you define "teacher"

- Many probably will be freelance or contractors, but there will always - should always - be a need for face to face interaction. It's an innate human need, and is how we've always learned / will be how we always learn

- Some teachers, especially in advanced education, will certainly work from home but the preponderance of teachers are still in the elementary and secondary levels. At the ELHI level the vast majority of teachers will continue to work on site.

- I cannot see Governments or Local Authroites shifting to becoming 'online educational organisations' so this seems somewhat unlikely. However we may see smaller clusters of learners working together facilitated by a number of peripetetic learning mentors.

- I feel the online element will be integrated in teaching in all its aspects, but it will not completely replace the physical teaching, both are expected to co-exist, each with their specific objectives.

- teaching is a difficult thing to do freelance, since the commercial attitude required for freelance work will get in the way of spending time to learn something new, to deepen

knowledge - or here too, there will be a more merit based way of assessing - so that the really great teachers will actually become more expensive. Online teaching will boost for some time, but the actual teaching and guiding may in the end take place offline more than online.

- he first thing that is nessecary is the individual and personal contact between teacher and pupil. Not only by internet. They have to really meet.

- I think this is too fast. this will only happen when government stops teh current financing system

- I would agree that the majority by then use online media for teaching and will work for online educational services. But I disagree that the majority will work from home. the majority of people in 2025 will still prefer working in a kind of office, whatever it will look like. Working at home, as current experiences show, causes problems regarding work-life-balance.

- It's in the mix.

- I believe instead that offline educational organisations will increasingly incorporate an online dimension.
  The importance of Freelance or for an online educational organisation will increase but will not become the majority. (at least in France).

- I think presence will always play a crucial role in education. ICTs will work as a support to traditional communication channels, which will not disappear.

- I think teachers have an important social and emotional role and this will not change so dramatically. They will however use more online input, some of which will be provided by other teachers.

- The system of the school will continue as a professional organization

- I believe in the value of presential learning in schools, albeit with the support of ICT

- This development will take much longer time. Online learning/teaching may be growing with an accellerating pace, nevertheless it will take a long time before it exceeds – if ever! – the volume of traditional learning. Rather, let's talk about flexible and blended learning, where different learning/teaching styles are mixed according to what's appropriate in the given learning/teaching situation.

- I think the face2face will survive longer

- Underestimates the role of schools as a social organisation. A move to online education becoming the norm would require massive social change in working patterns, child care responsibility etc. And there is no evidence that this is widely desired by parents or policy makers. Lastly would it even be a good thing, given the huge role schools play in developing interpersonal skills of all kinds

- See my answer to 1b. In addition, too many teachers are too hesitant to use technology. Many get trained, even the younger ones who people think are more attuned to using technology, but they don't grasp how it can be used to its fullest. So, no, I don't see it moving in that direction.

- Distance learning doesn't work for everyone - I think we'll go in this direction, but I think face to face teaching is too valuable both to the student and to the teacher for it to change to this extent. There are lots of activities that can't be replicated online satisfactorily - including student bonding, physical activity.

- Online learning is effective but especially combined with face to face learning. I think there will always be a role for face to face interaction between students and teachers.

- The direct relationship and shared experience between teacher and learner, I refer to the fact of being for some time physically in the same place, that happen in a class, cannot totally be substituted by virtual relationship. New modes are welcome but not to totally sweep off "old" ones.

- In many countries most teachers like in-class communication

- De acuerdo a la tecnologìa y la web podemos crear nuestro propio centro de estudios cualquier persona puede acceder........... sin importar idioma o razón social

- I tend to disagree. 10 years ago some thought that in 2010 we would only engage in online learning but that has not happened. And although technology keeps on developing I do not

expect 100% online teaching and learning

- Many teachers will do that, but I doubt it will be the majority.
- I really hope this does not happen. Strikes me as quite unwise.

- They will use technology, of course, but they will be better integrated in the physical learning community. School won't be the only place where pupils learn, but the whole physical space, and teachers will be where learning happens.
- Socially based structure are vital for the human being. I dont see the point in excluding people from informal interactions.
Instead, I see more de-structured environment for informal knowledge exchanges.
People need to belong.
- 15 YEARS IS NOT TIME ENOUGH TO DO THIS IMPORTANT CHANGE
- School and communication skills are important for the development of a healthy citizen. Private online tuition could only be part of a young person's education.
- Teaching and learning are closely linked to personal communication, personal connections and personal assisstance.Contemporary I do not see a way to help student learn without any personal contact.
- Personal contact is very import for good learning results. It is very import for adults and extremly import for non-adults. And it is not only the contact to a teacher, it is as well contact to all the co-teachers in the peer group of the pupils. So we will still have schools and classes / or learning groups.
- I suppose it depends on the definition of 'teacher'; arguably, the majority of teachers already work online - if you count all the different forms education can take. However, I strongly believe that there will still be the need for physical schools - and so, actual teachers within schools. Schools fulfil functions beyond knowledge-acquisition: childcare (parents need to be able to work); and social skills (which can't be learned in isolation). The role of teachers will change; but having physical learning spaces and bringing together heterogeneous groups will arguably be more important if 'education' remains, in part, social: developing young people who are fully rounded and ready to enter society.
- We're ALWAYS going to be social creatures needing a sense of 'community', so a physical school to go to will always be important. Team sports will always be a fun outlet for our kids too. I hope that's always available at school. We should also be 'equipped' to telecommute from home though when weather is bad, or when there's a particularly dangerous virus going around. Besides that, younger kids are still going to need ADULT supervision and structure in their learning environment.
- If with "teachers" you are referring to primary and secondary school teachers, I disagree. Children will always need to be supervised in some way, because their parents are working (and in the future, in most cases both parents will be working). Since it is natural for human beings to learn, they will learn while being supervised, and it is preferrable that they learn useful (rather than silly) things - which is why the supervisors will be teachers (whether they wants it or not) and it is in society's better makes sure to provide some qualification for them. As far as higher education, VET and professional training are concerned, the statement might very well be true.
- face-to-face interaction will still be needed - especially for formal and pre-school education - where would you leave your 3 years old child?
- Schools will probably remain distinct places of learning for the majority but some educational services will be offered online. In sparsely populated areas online communication may become dominant. Education will remain a public responsibility for the majority of pupils.
- Most university faculty in the US are fast developing hybrid as well as Web-only courses. These are conducted within the framework of their regular employment.
- at least in Germany the system doesn´t provide enough online based learning and teachers are employed with the state. I can`t imagine a change of thinking in the educational sytem towards less time in school.
- School is not just about learning from books but about social and cultural interaction with

peers and generating competences such as team work and communication. This is not possible when young people are sat at home in front of a pc.

- Again, this statement supposes that the students can be independent learners capable of overseeing their own learning, if not of directing it themselves. The majority of students will never be capable of this.

  The statement also does not take account of the fact that online teaching is much more time-consuming than face-to-face encounters. The economics of online learning make it extremely unlikely that it will ever be the preferred method of delivery in higher education. The only exception to this may occur if schools and universities are able to convince a segment of the teacher population that the advantages of working at home far outweigh a reasonable level of pay. If schools can pay teachers a part-time salary for full-time work, then the scenario described in this quote may come closer to realization than any of us will be happy with.

- I think here the issue is what is meant by "teachers". School for children has a socialising role among others and we may not want to make choices that put that into question .The importance of the role of the caring adult vàv children is underlined in research. Would distance teachers be able to play that role. However if the discussion is about the full range of "facilitators of learning" that's different discussion. We always come back to the need to differentiate.

- Ever heard about the power of the unions? 2100 would be a more realistic date.

- Schools are highly resistant to change. There is continued value in face to face and social interaction.

- A proportion of time will be spent online from a location remote from the school, but for both good professional and sociable reasons (teachers are people too!) they will still gather together physically for some of their work.

- There are more skills that you want to teach your students, like social skill's etc.

- There is a social and communal aspect to learning, schooling and education that cannot be sanitised-out - schools, in recognisable form, will continue to provide the location and facility for this communal dimension.

1.3 Comments on the third statement

> *"In 2025, the main role of the teacher "will be to stitch a curriculum together, join up the knowledge that can come from a huge range of resources and personnel who are Subject Matter Experts."*

<table>
<tr><td>Comments of those who strongly agree</td></tr>
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- It will be evolutionary (evolve in real-time as needed) and be decentralized. Less knowledge exchange will be done through schools and academic institutions. More will be done by experts. Think Financial Planning done by celebrity writer, TV personality Suze Orman.

- This will be organised through mobile, technological activities and communities.

- The main driver of knowledge dissemination and skill acquisition will be technology and organisation will be diverse, difficult and multi modal

- Especially through the connectivism way to learn. There will be basic contents to know and strong personal research interests.

- That requires a lot of time and thought to answer!

- Well, in 2025 there should be much more technical gadgets available to make knowledge change happen. In the near future, a wiki would be a good option.

- See 1.

- This remains me on the transactive memory (theory by Wegner). Everybody is a special expert and everybody should know who is the expert for a special matter. Thus there will

- be distributed knowledge and distinct knowledge.

- Adjustable and flexible curriculum, resources and continuous professional development will boost education

- Estoy de acuerdo porque el profesor será el experto en guiar el proceso más que en experto en todas las materias

- Now that's a big question! It might be something like 'slivers of time', whereby a population of subject matter experts, instructors, lecturers, groups, peers, hosts, etc indicate their availability at the beginning of each year, and then a personal web of engagement for each learner is negotiated accordingly, each timetable negotiating with others to ensure that everyone gets the level of learning exposure needed by the end of the year. Web 2.0 and semantic search technologies would have a place in this.

- I don't think it will be organized by 2025. There will be a large number of alternatives being tried in different levels and in different communities, but a consensus method will not emerge until well after 2025.

- Knowledge is anytime anywhere available. Validating and arranging will be the future gold.

- ...as it happens already today - I believe. But there will also always be teachers who will re-use their curriculum once stitched together for too long...

- It will still be organised in schools as social institutions.

- BUT: This not knowledge compilation and exchange. It is INFORMATION compilation and exchange. Knowledge is synonymous with meaning, and that must be created at the individual student and faculty levels.

Comments by those who agree

- Virtual team rooms will be the base for knowledge exchanges. Similar to knowledge management tools available today and used by some of the large companies, this subject team-rooms will have many of the communication functionalities of the social media of today and many other still to be developed and adopted. Subject experts and other contributors could join the virtual team and work together / complement each other.

- This can become a minefield of individual rights issues which will preclude free exchange of resources and knowledge.

- I will add running for motivating learning.

- Definitely yes. Teacher will also have the function of putting everything together. "Mass teaching" will changeover "individual teaching"

- Including this in both small and large scale
(of course they have to get paid for all this work but we are talking about future citizens' knowledge and skills here :-)

- I agree because I see the development right now with the programme 'Plannex' in which teachers can upload or find lessons which they can pass on to their students with online software.

- I think will be organised through networking tools and collaborative work.

- The teacher may be observing the Subject matter Experts, and supplement by coaching, summing up and motivate the students.

- Yes and evaluate and validate the vast amount of information and knowledge available.

- The media networks like the Internet should take more and more space and the role of the teacher become more and more that of an accompanist, but it will not necessarily eliminate its role as a benchmark in terms of knowledge.

- This is closer to the facilitated model of learning. However the key issue about the curriculum is presented here as an apparently simple step despite it carrying huge social, political and economic overtones

- We cannot beat Ted.com - and other sites. But if our idea of teaching changes, there is hope :-). Maybe there will be a new understanding in which taking responsibility for your own learning process means finding a teacher you can work with, not doing it all yourself while someone coaches you in the process :-) (I think 'we've misunderstood the import of social constructivism)

- Already today most people are happy to share their knowledge proactively through networking media and opportunities. This is true of course for 2.0 technologies but also for more traditional volunteering activities, where "knowledge keepers" are keen to disclose their experiences and acquired knowledge with newbies. There will be two ways in which the knowledge will be organized: bottom-up (2.0) self-organization through 2.0 processes and tools versus top-down knowledge management and delivery by accredited organizations such as universities and other knowledge or education centres.

- Internet already offers a huge amount of external knowledge - this will simply continue to grow. A large percentage of the material will not be provided by traditional authors of books but comes from sources like (future variations of) Google Earth, YouTube etc. Also traditional educational publishers will (need to) change their products to include the use of these external sources, helping the teachers stitch together the knowledge.

- The internet will be used as a source of information and to organize meetings. In those meetings, students will learn while their teacher helps them doing so.

- The problem is, you are talking about 'the teacher' - I think we will need a language that disaggregates the various different 'jobs' of a teacher and starts to specify the differences. So - one sort of teacher may stitch things together, another will specialise in certain areas, another may focus on building learning communities etc.

- Teachers are also always going to be moral guides and cheerleaders -- getting our kids excited about learning. I think the knowledge exchange should continue to take place in classrooms, except, as I note above, when weather is an obstacle, or when a virus is going around. I would also like children to be able to listen in on their class via skype from home when they're not feeling well.

- Personal learning spaces online.

- The teacher is one element within the learning world - a key element but nonetheless a single one. Schools will - in my view - continue to be the defining player in this arrangement - not the individuals who work within them.

<div style="background-color: yellow; text-align: center; font-weight: bold;">Comments by those who are not inclined either way</div>

- The main emphasis will be the same as today...trying to find ways to prepare students for jobs that have not yet been created. It is therefore going to be extremely important for teachers to be very close to latest developments in their sectors but also across education as a whole

- The role of the teacher will still be crucial, he will make use of SMEs as appropriate, but still be the main actor in education.

- The problem is not the stitch a curriculum together but
  1) how to teach (methodology, approach, tools, strategies)
  2) to realize a "studenting" process by Student, which would become learning stakeholder

- A yes and a no - in this view the role and responsibility of the student is too much reduced.

- I think that the student will also have in the future an important role in searching for relevant information and enriching the knowledge basis, as this is part of the skills he has to acquire.
  The teacher will have to provide guidance on that process (search techniques, critical attitude, negotiation processes, etc).

- There is too much enthusiasm on distance learning. In the future (IMHO) there will be a first, classical main teaching line, up to 10 years, a second main teaching line, up to 7-8 years, where there will be a classical teaching line along with experimentation and self development. In the third phase, the self development will become more important and some teachers should be able to project, realize and deliver teaching highly tailored and specialised packets on demand

- Firstly, Subject Matter Experts is a misnomer based on a canonical view of pedagogy. Teachers needs to engage in bricolage, but needs to have subject matter expertise allied to andragogic strategies for supporting collaboration and negotiating curricula along with heutagogic expertise in developing epistemic cognition by playing with forms.

- While I agree with the gist of the statement, that SMEs will play an increasingly important role in the learning activities, and, answering the question, a combination of explicit content

and informal sharing sessions will be the crucial knowledge exchange formats, I think the statement doesn't properly recognize the teacher role as knowledge "validator" regarding a certain field of expertise, aka "grading the student".

- Não concordo pelos motivos enunciados anteriormente.

- Partly, yes. What I miss is the role of the pupil.

- Same answer as 1b: Schools and teachers will act as learning navigators, coaching the learning process and 'learning career'.

- There are elements of truth here: providing guidance on the relevant learning resources. However, I expect learners to take a more active role in deciding their learning path, so 'stitch a curriculum together' is not quite what one has in mind

- I don't think this is that different from what they are doing already - teaching to their strengths. Exam boards will still monitor quality.

- Again, this will be less true in elementary grades and more in middle and high school levels. Teachers will be helpful in authenticating knowledge, bring students to resources, and enabling collaboration.

- I believe that it should be the learner who stitches the curriculum, with the support of the teacher. Curricula should be fully individualised.

- To permit a transition where the Subject Matter Experts becomes the judge of its competency, yes, this statement makes sense.

- I think the teacher will put together topics that have to be learned, but the students will be the ones responsible for their learning progress, so the teacher can give hints for where to find Subject Matter Experts, but maybe the students are more elaborate in finding their learning resources than we dare to think right now.

Comments by those who disagree

- This question is not easy to understand.
  I think curricula can be stitched together by anyone or even software.

- This is more coordinating work. However, the teacher plays an important role in pre-selecting the relevant knowledge and stay tuned with the knowledge creation process in the subject area.

- I think the question is not posed correctly. There is a difference between teaching and putting a curriculum together.

- I would prefer to believe that students will be able to choose courses and modules which they believe to be relevant, in accordance with the needs and demands of the market.

- The learner will decide what to learn and how to stitch a curriculum.

- Hope not. Human face-to-face interaction, personal feed back, inspiration from real life people are very important!
  This can also be provided online, but face-to-face interaction can not / should not be replaced completely by online contact.
  Online is a very good addition, in some special cases the only way of communicating, but should not become a substitute

- I do not believe the role of teachers will radically change, even if we can imagine that the most innovative ones will have more opportunities to extend their role beyond what they do today.

- IMHO the teacher will remain teacher but with more advanced tools for teaching.

- Implies that society does not have a view on the knowledge needed to flourish within it, and that young people do not have an entitlement to access and participate in the cultural heritage of their society. There will always be a big role for individual teachers to customise the curriculum but leaving it entirely too individual teachers to decide what to teach would be an educational and social disaster.

- I agree that that will and can be part of the teacher's role, but it should not be its "main" one. His/her personal involvement and commitment in the learning process, the emotional exchange with the learners, are part of being a teacher. Of course s/he can rely on such "Subject Matter Experts".

- I'm working in it

- The teacher is not a tailor!

- I am actually for what is proposed in the statement but am so afraid of who this teacher will be that I choose to vote against this. This will only work if the Teacher in question has the understanding and acquired the gift for teaching. Current teacher education fails to recruit, select and foster these talents so I am quite sure we will not be able to realise this idea, however positive as it may be.

- I don't agree because the new role will not only to stitch a curriculum together, but to guide through this curriculum. The teacher will be like an expert for knowledge management and in the same time a consultant and coach for the learning process.

- So-called "subject matter experts" currently have, and we'll have in the future, their own jobs which will continue to demand more than 100% of their time. Although some of them will sacrifice career advancement to assist students in elite institutions, few will sacrifice pay and career advancement in order to instruct marginal students who have no real interest in their subject matter. Without a time commitment from these experts, implementing this scenario would necessitate using resources like Wikipedia as primary sources of instructional information. I doubt that anyone would defend Wikipedia as a primary instructional tool, though it is certainly a valuable supplement.

- Will not happen this way. The big publishing companies involved in the school book business and the unions will fight the "mother of battles" against this.

- Yes teachers will be involved with organising the knowledge, but more important is their role in helping students to grasp concepts and learn from it and each other. Also a shift towards Skills rather than Knowledge is already well underway.

- Not even the teacher will do that. It will be the student. Technology will aid in stitching and bringing together modules and expertise.

- In 2025 there will be no such thing as a curriculum, because most learning is self directed. The knowledge field is to complex, and each individual approach represents a valid, but maybe not always optimal solution which can only be assessed by experience, and not by standards

- There are others that will do this. A teacher is not a HRM expert.

- Isn't that their how their jobs are defined now? I've had principals and teachers describe it precisely that way to me. So, no, if their training doesn't change, and that includes their school experiences from the earliest ages through to pre-service training, where their teachers all act like they have to know all the answers, then their teaching won't change. I guess it's the chicken-and-egg problem.

- This could technically be happening today as well but is does not (or to a limited extent). Why? Because people are still looking for structures that are an expression of quality

- I don't think it is up to the teacher to 'join up' disparate sources of knowledge - rather it will be up to the teacher to facilitate learners in their own 'joining up' or construction of understanding. It is more that the teacher quality-assure and direct learners to valuable sources - and also develop learners critical skills in evaluating and distinguishing between subjective and objective information, what sources can be trusted and what source demand greater scrutiny.

- This will not be the role of teachers, but of policy makers in the area of E&T, a role they might decide to share with publishers or (head) teachers who act as mediators and resource managers, providing the teachers who work "at the front" with materials that have been compiled didactically and pedagogically.

- I am not sure policy-makes will let the power off. I hope teachers will be involved in curriculum choices, but I do not see it happening.

- There should be learning pathways for young people that are responsive to their needs.

- This sounds too depressing for words! It sounds like a very technocratic vision that takes the soul out of the process of learning and supporting learning. We need to be thinking about curricula that really do put the learner at the centre of the process and that means

recognising that people have very different learning processes and needs. They need to be given the opportunities from very young to understand how they learn best and what they need to learn effectively - learning to learn how you learn. So that suggests a dynamic process between teachers/trainers/facilitators of learning and the individual learners in their groups or not depending on the situation.

- Education will be very personalized.

2. INSTITUTIONAL CHANGE
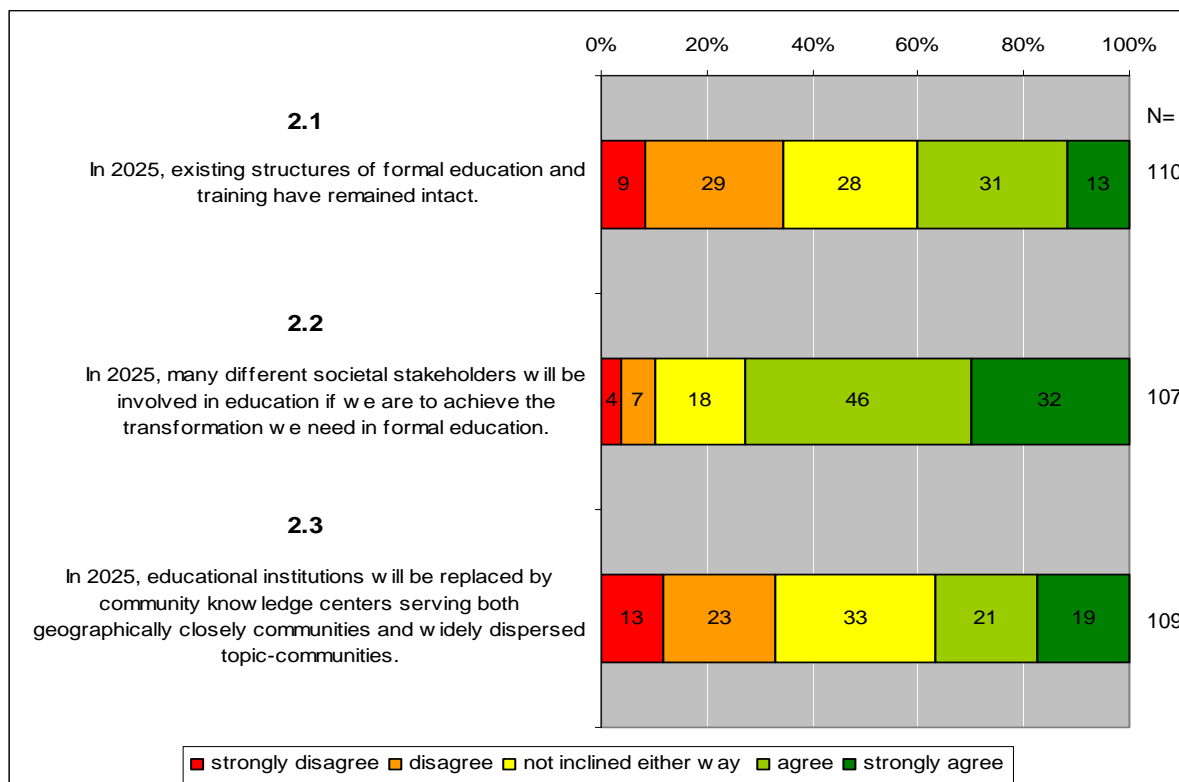
Figure 16: Results of online consultation (part I) on institutional change (in absolute numbers)

2.1 Comments on the first statement

> *"In 2025, existing structures of formal education and training have remained intact."*

Comments by those who strongly agree

- We humans need to categorise, get feedback and support. We also need to know where we stand with our knowledge. We also need to compare ourselves to others, in order to develop and have life goals that inspire us to move forward. So existing structures of a formal education is unavoidable.

- Because the need for formal degrees or at least standards of professional education will remain. Anyhow they will be completed more and more by informal education/training

- Combined effects of adaptation, momentum, and customer preferences....

- I think it's going to look very similar -- we'll hang on to the things that work best, disregard those that don't work, and use technology to enhance the learning environment and tap into resources all over the world. The most important thing to keep in mind though is that IQs are going up everywhere and this trend will continue, and information is doubling every couple of years. This pace of information explosion will continue to accelerate as well, so curriculums will have to remain open and flexible. Teachers who are not comfortable with constant change and ongoing evolution will not thrive.

- The old fashion classroom teaching will be replaced by learning environments in which students are free to surf and choose their activities. Very similar to what's happening in "creating" companies, like Apple

- My vision is that structure gives guidelines as to where students can get a save learning environment. If they are present in school or at home, they will be happy to have a person they can trust which supports them in their learning.

- Think about the power of the church and the teachers-unions in the field of formal education. Nothing will change such "fast".

- People are conservative and education even more so.
- As I said before, institutions will be needed as a place to be: to socialize, communicate, live and learn - at least for minors. As concerns lifelong learning, structures are changing already and most probably, in the future, institutions will play a minor role and places to learn will be distributed across different real and virtual groups of learners, who will still join in a common learning endeavour, but not necessarily identify with the institution that they happen to subscribe to formalise their learning.

- Government will want to have influence/power over the system. this is a surviving-necessity
- They will remain intact because of their indispensable role in social integration. However, there will be much more networking and cooperation with external institutions (such as companies, cultural institutions etc.)
- Unfortunately I do agree but would hope that an strong alternative approach is fast rearing its head e.g. School of Life in London UK
- The superstructure may be intact (e.g., cutting between primary, secondary and university education). The classroom will always exist. But practices have changed significantly.
- I fear that little will change in terms of the existing structures of education and training - the past four decades of experimentation with alternative structures has not yielded a robust alternative.
- The formal structures yes, we'll still have an educational system, but the content and process may be very different. Also, there may be a rise of in-house training and online modules people may learn from before entering some form of formal training in an institutional setting
- Schools as an institution develop rather slowly. So I think that the future for learning will last long, but I think ICT will have a huge impact on the learning of students.
- Much as now as far as schools are concerned, hopefully more parental involvement and 24/7 informal learning undertaken and recognised formally.
- Yes but a lot will have changed - either subtly or to a marked extent - within those arrangements.
- While the existing structures will remain intact, they will change in order to answer the connected world challenge and the changing demands from the target audience and prospective employees. Which means a greater usage of SMEs, Blended learning and continuous learning activities and assets (post formal learning experience).
- In tact, but hopefully transformed and updated
- I think the future framework will allow a more personalised educational journey for students - including assessing them in a range of ways, not just exams.
- I wish they would disappear altogether, but we should never underestimate the inability of politicians to do some real learning. So yes, it is very unlikely that things will change in countries like Greece or France...
- 15 years is not long in social transformation. Give 1 or 2 generation to see major changes in now strongly structured institutions.
- There will surely be a change in the structure and also in the manner of conducting education and training. Probably the structure will be simplified and tutorials and videos will be the main teaching method.
- In some countries school buildings are the only state institution existing in vast areas
- I think they will not change so much. Likely the structures will be supported by new tools like interactive whiteboards.
- Undoubtedly there will be change. But outside of the community of educational technologists there is less pressure for radical change than they think. Gradual evolution is more likely, driven by concerns with quality of outcomes as well as economic pressures. But as yet there is no viable alternative to the existing system in view.
- De hecho las estructuras de educacion formal siempre tendran un espacio físico,

claramente tendran rasgos intactos de acuerdo a la orientacion pedagógica pero tambien evolucionará de acuerdo a la exigencia

- - More inspirational teaching
  - Restoration of Education as an instrument towards inspiration and "people moulding and culturing" instead of solely a tool towards just distribution of knowledge.
  - Less focus on IQ and more on helping people reap the full potential out of themselves and motivating them to do so.

  At least that is what I hope and what I am actively pursuing.
- I THINK FORMAL AND NOT-FORMAL EDUCATION WILL COEXIST
- It remained intact as institution with rooms and teachers but changed in the art of learning and the role of personal.
- My answer to 1b and even 2b gets at this.
- Please see answer at question 3. I do expect formal educational facilities to be in place. Might not be the same ones as today, but there will be some structures in place
- To open to institutions, and other educational partners.
- Institutional change is slow. Institutions will not be dramatically different in 15 years.

- There will always be a market for formal education and training which confers recognized accreditation.
- There is going to be a significant shift in favour of informal education as the main driver for teaching and learning will tenaciously influence interest in policy and in teaching and learning. Traditional framework will probably be shaken and re-arranged.
- I think there will be some changes but also there will be still the old structures which will remain intact.
- Some will change some will remain intact based on needs and levels of education.
- Creo que los colegios o universidades serán lugares de encuentro para actividades experienciales relacionadas con el conocimiento en un contexto social.
- 2025 will be within a long period of transition to new, some currently unforeseen, paradigms. The framework of 2010, however, will still be recognizable with experiments of other approaches all around it.
- Society is wedded to its formal qualifications and obsession with testing. Learning for the sake of learning, or even for pleasure has long disappeared and is unlikely to return. Educational buildings are also useful places to herd young people who have no hope of work.
- I think formal/institutional learning will be more flexible and open to new competences and informal curriculum
- I think that this development of more dynamic approach towards recognition of knowledge and skills will continue.
- I think they will still exist but of course they will be transformed by the innovative processes and technologies that will be adopted by the education community.
- This question needs to be answered per level of education.
  Primary education will not change as dramatically as higher education. Children need guidance (though social media will play a role in learning) - while training in companies will change more.
- Some parts will remain intact, others won't. It won't be even and it won't be universal. And even in some remain intact, they may be doing very different things.
- In 15 years, an increasing number of teachers will be digital natives and one can expect that they will incorporate new technologies and teaching methods. It may however happen at individual level and not at institutional level.
- As long as accreditation is fully owned by educational institutions this is likely to be true. If the EU i2015 requirement of integrating informal, non-formal and formal learning is implemented innovatively in a way that is appropriate for the Information Society this might

be different. I presented a paper on how to do this at CELDA 2009 in Rome

- Most institutional features will remain the same. There are cultural, institutional, and political reasons for the status quo. That being said, some things will continue to evolve, more online learning, more technology, and hopefully more cross-curriculum knowledge gathering and information processing.

- Some of it will remain. There need to be different systems at the same time.

- As stated before, I think there will be a mix of structures, and it is hard to predict how things will turn out

- They will have changed. New skills, different curricula, different work spaces are required, but not a full transfer to online.

- As already indicated, institutions will be able to incorporate some level of online interaction with students and parents.

- I think that there will still be the need for formal, qualified/trusted, structures and institutions - if only as a means of 'quality assuring' someone's qualifications. There will still be a need for benchmarking, and so formal qualifications and recognised centres of excellence will arguably be more important to differentiate, say, between candidates for a job. While learning will increasingly be formative - i.e. students will be judged on process above knowledge retention, through a portfolio of work - experience will still be primarily judged on qualifications, previous employers etc.

<div style="background-color:orange; text-align:center; font-weight:bold">Comments by those who disagree</div>

- Some of them will remain intact but most of formal learning will be online.

- I think learning based on competences which one have to develop is getting more common. So learning isn't bounded to a classroom anymore. Students will create their own patch of learning and master the skills needed for their professional life.

- Informal learning will play a key role in personal development.

- If they have, we've failed. But I hope that demographics, politics (with a small 'p') and common sense have prevailed and we end up with a system like that described above.

- I believe most of the existing institutions for learning will still be in place (many of them due to inertia more than anything), but the future successful institutions will have changed significantly the way they are organised and the way they deliver education. For one, delivery will shift towards a virtual learning with online education taking over from class based learning. Moreover, the assessment process will have to change dramatically over the next years, to allow for changes in the delivery of education and for a globalisation of the learning.

- I think the existing structures can't keep up with the technological changes.

- Die formale Bildung wird stärker ergebnisorientiert sein. Anwesenheitspflichten etc werden aufgegeben werden.

- Many structures will remain intact, but many won't. All will move toward distance education.

- If formal education remains intact it has few opportunities to survive.

- Institutions won't survive if they do not anticipate enough (and I expect them not to)

- Please refer to previous question.
  Maybe there will be a more intensive use of community of practises

- Não, a educação mesmo formal, evoluí, lentamente, mas evoluí.

- More competition for teaching budget between public and private sector, and across borders.

- 2025 is closer than one might think. So, there will be structures left. But I sincerely hope that there will be more trust to give room to pupils to find out things for themselves and for teachers that they know what is there role. To find a balance between 1. Doing everything there way and pupils will have to follow and 2. Working together with pupils to get the best results together. And for teachers to really work together with their colleagues.

- Same answer as 4b: schools will be 'learning centres' which will guide you in your 'learning career' whereas now schools still want to function as the main actor in creating

understanding and amassing knowledge.

- It will be more freedom in content and curriculum. Different stakeholders will drive institutions.

- Though slowly, things are moving: the Bologna Process, the EU policy Education &Training 2010 and then 2020 and others, are having an impact. Hopefully things will speed up at some point but for sure in 15 years something will have changed. The market and the society are asking for it.

- Frameworks might be different depending on many factors

- More decentralised, less municipality control

- Largely intact for a small group of people who can afford on campus education and training.

- Hope not, because there an industrial age, largely behaviourist remnant of a past. The only thing that hasn't changed fundamentally in the last 50 years are our schools

- Education and training systems will need to change to meet the needs of the day.

- Again this is the issue of degree and context. Formal structures are changing and evolving in some ways all the time. When does a tipping point come that allows one to say that this is really very different from 10 years ago and what factors are we looking at....... Sorry but it'd be too long to go into more detail!

- To survive, structures must change.

Comments by those who strongly disagree

- The factory, taylorist-type of institution that schools are today (maybe functional for the reality of the world of work in most of the XXth century) should adapt to the knowledge society of today. Inadequacy of school model is one of the most important factors for drop-outs.

- - Spaces will be transformed and will be more open and human conscious (environmental, healthy, energy saver, etc.)
  - The curriculum will evolve for local exploitation and needs, with resources. National curriculum will be de-structured.
  - informal learning will take place at enterprises and the budget will merge from the formal. Classroom learning will be minimized and used in important and relevant occasions.

- Current structures will follow trend and adapt themselves to the new reality. They will have to compete.

- Already in the literature by Dede 2008

- It is a 100 million dollar question

- Too difficult to predict - the world is very unstable. But change is a certainty.

- Mentioned before

2.2 Comments to the second statement

> *"In 2025, many different societal stakeholders will be involved in education if we are to achieve the transformation we need in formal education."*

Comments by those who strongly agree

- Global educational agencies and communities.

- These are mainly employers (firms/industry), as well as psychologists, sociologists, above mentioned experts etc.
  Are involved by opening the development of curricula and educational processes (open education...)

- More than anything, it is important that our children be EXPERTS at taking care of the planet -- experts at managing ALL existential risks and managing all resources. Our

scientific community in partnership with our governments should shape education.

- The question says nothing about "most relevant"; only that they will be involved.

- Education is a continuing process, everyone needs to contribute

- Other persons involved in cultural institutions (media, neighbourhood networks, museums, theatres,...) and companies.

- Everyone - and I don't mean that flippantly. Taking a more holistic view of your individual learning needs will be critical. therefore learning in four domains - intellectual/ emotional/ physical and spiritual - becomes a common form of learning

- Stronger involvement of parents and other family members, peers, youth leaders, local industry leaders (entrepreneurs), etc

- And it should start with learners themselves, and the development of proper learning communities...

- Societal stakeholders and those people and organizations that are a part of one of society's systems: educational, medical, economic, judicial and so on.
If education is to be in tune with society's needs and demands, all those involved in shaping the society should have a say in education.

- Health
Welfare
Environment

- EMPLOYERS, TRAINING THEIR WORKERS

- Employers / companies

- Kids and learners in general, as they are the main stakeholders, they should be involved (but I am not sure this is going to happen in the future, this is just wishful thinking). They could take decisions in curriculum development, assessment methods, etc. Having said that, they (and parents) tend to be quite traditional.

- Parents, churches, community groups, academic institutions, government, businesses, non-profits.

- Yes, there should be an interdisciplinary collaboration!

- Sociologists, computer scientists, psychologists

- Why not? If what we have is not effective let's find a way to make it work, but just because you've experienced school/college doesn't mean your contribution can be valid. We've all been to the dentist, but you wouldn't let just anyone drill/take out you teeth.

- Helped by digital communication, parents should have a growing role. School has lost contact with what is happening at home or in the private online world. Parents need to regain their position in education.

- The main stakeholders which I expect to have a significant involvement in future education would be enterprises of all type and size. Education should prepare people for the work life and today there is a significant disconnect between education and enterprises. Enterprises could be involved in the education process in providing specialist expertise in various subjects, in providing a training platform for people to acquire the needed skills, by providing input into the knowledge base used for education, by being involved in traditional education providers such as teachers, researchers, assessment companies, etc.

- - Businesses/organisations
- (Grand)Parents
- Educated abroad (remote)
They can also coach, socialize, transform etc.
We just have to because there are not enough teachers available.

- Concordo. A escola deve formar cidadãos que se integrem bem na sociedade e para isso todos devem ajudar a escola a fazê-lo e não criticá-la quando algo corre mal.

- Enterprises and subject matter experts - to define clearly their expectations and to take part in education knowledge
Learners them-self and build by them NGO as well as communities

- Mainly the students/pupils themselves, by being able to pursue in self directed learning, without a fixed curriculum

- I'd be happy to go into this another time but..... it's along story.
  2 quick points are the obvious ones about parental involvement in the individual learning plan of their child. Also the mutually supportive role between local communities and schools.
- They could value their own excellence.

- The role of educational experts outside schools will increase. Knowledge can be provided by all kinds of experts, in or outside the educational system. There will be the matter of arranging the sources of knowledge.
- The teachers - unions and the church will see to that this will not happen.
- More collaboration with universities and industries will exist to prepare for later functioning
- Parents / carers. Co-providers of learning.
- Education is too important to allow sequestration by corporate interests.
- Companies will be more involved, as well as social agents in general (communities, ...).
- Stakeholders are essential and need to be part of a delivery of education - I would include those who are acting on economic, social and environmental issues.
- To make efficient influence on a strongly structure institution, yes, we need leverage from other stakeholders.
- Do a considerable extent this is already true in the UK and will increase, with the involvement of employers and intermediate organisations such as faith organisations. Some teachers are resistant to such outside interference, as they see it, but if they want education relevant to the demands of modern life then the involvement of employers is necessary especially in shaping the curriculum, in preparing students for work, and in inculcating the general skills and disciplines required for work and citizenship.
- Mass Media Directors
  Communal representatives
  Cultural Foundations
  Industries
- I can see community of practitioners as the stakeholders and their roles will change to address industry specific needs for learners.
- Sometimes Academic World and Business/"Real World" are so far each other. New topics and approaches from "Real World" will be needed and must be introduced through new curricula designs and informal teaching.
- I think this is one way to ensure the up to date information as learning material.
- I think new technologies and new knowledge exchange practices will give SMEs unobtrusive and low-cost opportunities to share their knowledge. Most of the effort done today to produce eLearning is capturing knowledge from SMEs. Once captured, putting it into a format that fits educational needs is a relatively easy and cheap process.
- Parents, Social institutions,
  There have to be more cooperation
- Vocational training providers, enterprises, social actors dealing with excluded groups of the population (public bodies and the 3rd sector - volunteers, NGOS, civil society)
- Yes, we need a transformation in the role of stakeholders. JISC in UK are doing some work on this and I have written on the need for Public Value measures, a networked Public Value process, to enable appropriate embedding of stakeholder influence. This should be allied to an increased professionalisation of "teachers" skills (see above)
- This is already true. I don't envision new stakeholders emerging. These are policymakers, administrators, teachers, and parents. An interesting development is teachers and parents uniting to foster change, for example in LA these groups were the most effective in getting new charter schools approved.
- Companies, non-profits, government. provide (societal) problems that need to be solved. Raise awareness.

- Employers, government, communities.
  They are best involved when they are conscious on the fact that the whole process is about co-creation and they are invited to join in.

- NGOs
  Artists / people working in creative sector.
  Companies
  By providing examples, internships, participating in projects

- The stakeholders who should be involved are the 'role models' in which students can see an example. Teachers can do that, but also fellow students.

- Informal learning activities, interest groups, communities

- In terms of how could/should they be involved, see 3b. In terms of who, then it's probably anyone. As we all to some extent have a stake in the education of our young people, then anyone with specialist knowledge, skills or experience should be obliged to provide some of their time.
  As an aside, I think you mean "social" rather than "societal" ...

- The education will reflect the changes in society when it comes to skills demanded at work. Should be involved to inspire, not to overtake the teacher's role completely, but to supplement the education.

- Citizens group, business, NGOs, cultural associations, independent citizen driven schools, the open source movement.

- Business
  Researchers
  NGOs

- Invite them, ask them how they want to work together. Open the doors. Make agreements en plans. Go to their workingplaces en take pupils with you. Ask parents and pupils to think about it too.

- Everyone is involved, no? "As TV brought the world into our living room, the Internet brought us into the world." (NN) The distance to information and to knowledge network who can enable understanding, knowledge, skills, competences will get even shorter because of mobile technology and augmented reality.

- Municipalities, expert communities, independent think tanks, international organizations of knowledge promoters

- Parents are the most likely additional element, but some extra engagement with industry, NGOs, etc too

- From representatives of the civic society (including social partners) to experts, companies and public services. Some of their inputs can be provided in the school or in other outside the school environments

- The role of the teacher and the school leadership will act as managers and intermediate for learning.
  In training situations the focus will be not anymore "at the end of the course you will be able to ...." but instead "what questions do I look to be answered on this learning situation".

- It depends on the ways they are involved.

Comments by those who are not inclined either way

- They will be involved more in non-formal, informal, and experiential LEARNING, not just formal education.

- In my practice (secondary education), outsiders are already present (actors, fire fighters, bailiff, curator of the museum ...). I don't see the need for much greater external intervention.

- I think it depends on what is meant by 'involved' - one could argue that there are too many involved already, in terms of political and economic control of education. The nature of the involvement has to be defined but it could go either way

- Many societal stakeholders are already involved - it is unclear here, what is meant with the transformation we need. I think the transformation we need is a more inclusive way of

teaching - focusing on diversity not for morality per se, but for richness.

- I am still thinking about this one. This could mean many different things and the statement above is not precise enough for me to answer properly.

- Maybe this will be true in Europe, but it will not happen in the United States. Education, and the teaching profession, is still largely undervalued in the United States, and they will remain so in 2025.

- There is a trade off between an increased richness from inclusion of a broader array of stakeholders and the potential for a chaotic result from participation of untrained teachers. Experts have a lot to offer, but teaching is a separate skill. As Beverly Sills once said when asked if she would teach opera once her voice began to fade: "I wouldn't presume to know how to teach."

- What kind of transformation is meant? and I think that in education today there are many stakeholders involved already

- Parents are the ones that could be more increasingly involved.

- I think that employers (in the broadest sense) need to become much more closely involved and engaged in education. If *one* of the purposes of education is to output employable graduates, then educational institutions need to listen more carefully to what employers are looking for in terms of skills - and these skills need to be given the same weight as subject skills (which will inevitably date).

- This is the most critical point because the school (at least in Italy) doesn't seem currently able to set this kind of change. This is left to the will of individuals.

- Companies, services providers, families and the very public administration: they are becoming increasingly aware that they are clients, customer of the education system and they have demands and expectations, needs and requirements (they are becoming aware of the political and economical price...).

- Education will become "social", meaning produced by and available in society in general.

<div style="background:orange; text-align:center; color:white; font-weight:bold">Comments by those who disagree</div>

- De acuerdo a la carrera, fines, principios y estandares de la educación del plantel

- They are part of the curricula and docked personal and via information systems.

- I'm not sure what that person is referring to. I think parents are the main stakeholders that should get involved and become more active in teaching their children, but they've been led to think for so long that only teachers (the so-called experts) can teach their kids. The homeschooling movement, while growing, will still remain a very small percentage of households.

- Pienso que la educacion deberia considerarse un bien para la humanidad. El conocimiento está en cada ser humano especialista en alguna materia u oficio, y que estos son entregados a sus pares de manera colaborativa y sin fines comerciales. Visualizo un mundo más consciente de cuidar el planeta y a sus habitantes. El transpaso de conocimientos de unos a otros será una medida responsable y acordada por la sociedad planetaria como único modo de sobrevivencia

- Bildung sollte auch weiterhin den Menschen befähigen, sein Leben erfolgreich zu organisieren. Die momentan in das Bildungssystem drängenden "stakeholders" stammen aus dem Bereich der Wirtschaftsverbände. Diese sind ausschließlich an sofortigen Verwertbarkeiten interessiert. Das ist kurzfristig gut für die Wirtschaft, aber schlecht für die Menschen. Langfristig ist es für beide Bereiche bedenklich.

<div style="background:red; text-align:center; color:white; font-weight:bold">Comments by those who strongly disagree</div>

- I don't understand the statement. What is the transformation we need to achieve? Aren't already "many different stakeholders" involved?

- We need to have a clear objective for education as a society and a culture - not be swayed by group or individual agendas and interests (which is what 'societal stakeholders' seems to indicate)

- The question has two statements:
  That is not something for 2025. Already there are many stakeholders, see the heavy

debate on "new learning".

- Schools will stay in the future as institutes where you can learn social skills

- Don't quite understand what you mean by "societal stakeholders". Governments should be removed from all position of influences and Education matters should be left to practitioners. There will for sure be input from all members of society but this need to be channelled towards achieving the real aim of Education...preparing kids for jobs that do not yet exist!!!

- Confusing statement - are you asking for what should happen or what will happen - can't answer.

2.3 Comments to the third statement

> *"In 2025, educational institutions will be replaced by community knowledge centres serving both geographically closely communities and widely dispersed topic-communities."*

<div style="background-color:green; color:white; text-align:center; font-weight:bold;">Comments by those who strongly agree</div>

- Yes, educational institutions will not be bound by boarders.

- will not be replaced by, but are called so in the future.

- That is certainly a desirable future, and we can wish that it will be a self-fulfilling prophecy... Learning is communal, learning is social, and today's institutions are all but constructed around communal learning...

- The information on internet already proves the 'knowledge centers' are forming and that this is a strongly informal process (untill now). Information sources (e.g google earth) or practice and test sites are being developed by external organisations with no direct contact with the end user. If we want the educationl envoronment to also still be form part of our (local) culture, the knowledge centers will have to be part of the local community.

- - interact with others
  - share expensive facilities
  - younger: need for 'day care'

- Because communities of learners can facilitate a much larger number of different subjects and to because all people will become dynamo's of knowledge in their own field

- Put that in 2075 at least. But yes, the idea of a physical local structure of knowledge exchange is credible, if not desirable.

- roles of teachers, mentors, students, developers, and managers - paid, and unpaid

- It is no longer a matter of quiestioning the need for change of institutions, but when and how they are effectively going to adapt to reality and social trends. Same answer as 1b: they will serve as guide in one's 'learning career'.

- 1. Providing adequacy on learning situations and contexts for students.
  2. Compromising on solving problems and gathering local learning solutions
  3. Visibilty for social examples and cases
  4. learning with teh network and disseminate benchmarks

- Community knowledge centres would not be age specific so would enable all learners to come together and create a learning community - it would allow knowledge and experience to be made available alongside enthusiasm and creativity towards learning. The potential impact of such centres, at local, national regional and global levels, could be huge - truely moving towards Ivan Illiach's 'webs of learning'.

- adapt curriculas, select relevant knowledge to community, ...

- Deben ser los lugares de encuentro para organizar, planear y evaluar a las comunidades locales y desde allí conectarse con redes de comunidades de aprendizaje del mundo. Permanecer en contacto para nutrirse y entregar conocimiento conformando redes que se retroalimentan.

- Subject-led learning with direct applications for local and international communities is the key here

- Arranging, arranging: listening to the learners needs. Distance will probably be irrelevant

- The community knowledge centers will take the shape of centers which offer specialized modules and learning programs for the regional market. The courses will be decided in accordance with the yearly market demand for the region.

- Communities will play an important role in education, acknowledging context, culture and knowledge level. Learning in communities, through discussion, exchange of ideas and suggestions, relates to effective learning

- Somehow agree.... there are already steps in this direction with many institutions such as secondary schools and universities providing wider services to a local community or a broader audience via online education. This trend is going to continue but not all educational institutions will change into community knowledge centres. There will be a clear segmentation / fragmentation of the educational institutions, with some changing into community establishments, other specialising in a particular subject / specialist area... while other will transform into research organisations or even commercial organisations.

- These exist already - 'learning villages' in the UK for example. Also public libraries for many years, but unrecognised.

- Replaced; no. Complemented and supplemented; yes.

- I think this is already happening - it's just a process of bringing together existing extra curricular learning to create something more formal.

- Knowledge centres will be more concerned about job-specific training and courses and it will operate on the framework of collective knowledge sharing and gaining.

- This represents an ideal model, and good practice is emerging in this area. But it also requires major changes in the budget process. Budgets need devolving into communities as well as responsibilities, and we need community capacity and de-institutionalised learning processes to enable this.

- I basically agree, but there is still a difference between educational centers and knowledge centers. Knowing how to teach is very important in the former, less in the latter.

- Could be as a result of the spread of infrastructure for new technologies. I hope so.

- Yes, but I don't think these will be physical community centers.

- I think we'll always have schools and libraries -- both which we'll be able to access from home if we don't feel like going out due to weather or health issues.

- Schools are likely to remain distinct learning organisations. "Learning community center" may be just a new name for them. But it could mean that specific competences in a school could reach out beyond into far reaching networks.

- i would love to say yes as i detest the current form of executive education promoted by business schools but i think it is so cemented in our western cultural DNA that it will be hard to shift

- Not 'replaced by' but rather 'augmented' or 'complemented'

- why should they?

- I think community knowledge centres will become very important but since they are geographically limited, they will serve a specific purpose. Since so much knowledge and innovation is taking place globally, there will also be a need for institutions and groups which promote global knowledge sharing and exchange.

- Maybe, this will happen, but I'm not sure if this can occur till 2025.

- You mean a library? Who thinks up these labels? Is a knowledge centre a learning centre or vice versa? Does changing the name imply changing what happens inside? If only it were that simple!

- Não concordo. Alguns destes centros já existem, mas todos nós precisamos do contacto

- social.
- Partially will be true. Main problem will be particular way of self-financing.
- Hopefully there will be a lot more that will probably not repalce but complement. Also it depends on how much and in which ways traditional insitutiions are prepared to change. The timescale is important here. Education system change very slowly from some points of view and are gradually evolvng from other points of view.
- In my opinion this event is a possibility, surely not realizable everywhere.
  It is not possible to describe in few words their role.
- I don't think the ones will substitute the others. I think their core activities will be different, each focusing on what fall more naturally under their own immediate scope (the ones: teaching; the others: applying their knowledge to the real world).
- I do not understand very well the concept
- Community knowledge centres can be wonderful for life long learning, after school learning etc.
  But not to replace primary & secondary school that should remain to provide basic learning skills and knowledge to youg people.
- I can definitly see the good parts in this, but I think that being in personal contact with someone makes the learning experience more effective.
- I think intitially a trend to communities, and after a decline, more involvement for educational institutions who fully adopted distance learning and technology.
- Maybe that will be the case for professional education, which will be reflected by the closeby need of the society, but I believe there will be more specialized educational inst. for the more acadamical track.
- Institutions will probably not all be replaced, but could evolve more into this direction.
- Transdisciplinary education and research, technology transfer and innovation, bridging gaps between academia,   needs and interests of local people, industry
- both
- they may not be replaced, but will rather be embedded.
- Maybe, but only for the wealthy elite.
- again, it is not either or. and impossible to predict
- I do not agree on the "replacement" phenomenon: maybe they will start complementing the "traditional" education institutions and trigger a dialectics.
- Lo siento no pordria responder esta :-(pero estoy de acuerdo tengo que aprender màs sobre los centros de educación que desde hoy mismo exiten como fundaciones, centros de investigación y las empresas co mo Oracle que capacitan a sus usuarios para un eficiente trabajo en sus software
- I have no idea what any of that means.

<div style="background:orange">

Comments by those who disagree

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- Education is a business it its own requiring specific skills that may go beyond knowledge centres (depeding of course on hwo you define those knowledge centres
- self-learning centres will only be an addition to institutional learning
- Traditional Educational Institution have a great asset that no newcomer (either in format or as a new organisation type) can easily compete with: recognition. And most of the actual value of a degree is connected to the validation and certification attached. That won't disappear. What will happen is that the educational institutions - at least the more advanced ones - will change in order answer to the new challenges.
- Never mind whether it is feasible, is it even desirable? The term 'community knowledge center' may give some a warm glow but what does it actually mean, and how would it differ from existing schools? I think the proposition as it stands is meaningless.
- The collaboration of both is needed
- Nice but not realistic idea. It would need a huge cultural/institutional/political change. Not

short term, maybe in a far future.

- I think the changes happen mostly inside the exsisting institutions not so much in the macro structure.

- educational institutions always will be required for initial education. It is the post-initial that will change dramatically. But we have to prepare pupils and students in initial education for the lifelong learning attitude required for the post-initial education.

- I don't think knowledge centres can replace educational institutions, but perhaps they can be co-workers, though

- No, I do not expect that to happen. The educational field has to much on it own plate. After the solution to all of their own questions comes the next step.

- Community facilities could be very supportive of lifelong learners, but I think young people like the sociable aspects of schooling a great deal and we will still have institutions which accommodate them

- They will provide support but not replace the educational institutions

- You know this also depends on what kind of country this regards. In essence I dispute this as Teaching and Educating people should be done by people with a passion, drive and gift for it. This gift can be acquired with education. But like with singing or dancing, some people are born with the gift.

- This is feasible, but the entrenched interests of existing communities will slow any transition. In any event, community knowledge centers, to the extent they come into being, will be at the fringe of much of the current system of education for some time to come.

- The role of community knowledge centres will increase but will not be central.
  They may be used by parents & students to assist the traditional learning processes.
  They may also be used by the traditional institution to help them enhance their offer.

- I don't believe exsisting educational institutions will be replaced: and exsisting educational institutions already provide 'centres of excellence' around certain topics. I can see how institutions will increasingly become 'world centres' for certain topics - and networks around subjects will be increasingly virtual (pooling the best brains worldwide). I think that there will still be generalist education providers (schools and colleges) that will serve the local community.

- I don't think so - I think we'll see specialisation, and this suggests two radically different jobs for the institution, I'm not sure that is feasible.

- They could complement educational institutions. They are a good way of bringing the key stakeholders together to look at what skills are needed in the community from local business and securing provision.

<div style="background-color:red; color:white; text-align:center; font-weight:bold">Comments by those who strongly disagree</div>

- Not replaced; additional. Maybe transformed into.

- There may be such centers, but I don't think they will replace institutions. They won't have the desirable status.

- Think about the power of the church and the teachers-unions in the field of formal education. Nothing will change such "fast".

- Education is about more than knowledge.

- There is not a strong source of funding for new initiatives, instead society is sort of retreating into protecting existing interests. I don't see a strong stakeholder base for this either, so it's unlikely to happen.

- We won't need them, so we can spare the expense. Schools, colleges and communities will evolve to play this role.

- Educational institutions may evolve towards greater openness and interconnection. However, I do not think it should be "replaced" within 15 years.

- The statement is to absolut. I belive that schools and universities will become learning centers leading to such closeby and dispersed topic-communities.

- knowledge can also be obtained by individuals at 'home'

3. INCLUSION
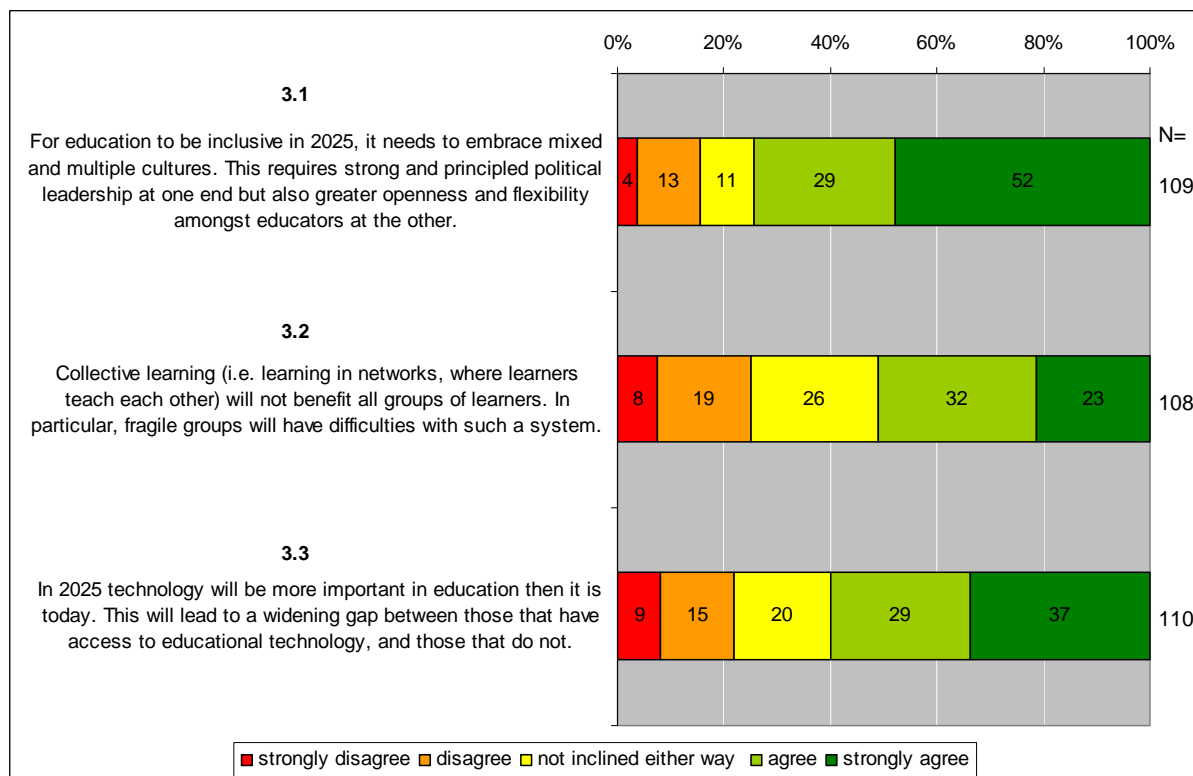
Figure 17: Results of online consultation (part I) on inclusion (in absolute numbers)

3.1 Comments on the first statement

> *"For education to be inclusive in 2025, it needs to embrace mixed and multiple cultures. This requires strong and principled political leadership at one end but also greater openness and flexibility amongst educators at the other."*

Comments by those who strongly agree

- Agree, but do not believe it will be achieved

- Yes, we need to make education a reflective process (learning about learning) to adapt while having solid principles.

- Very true! and leadership should also be shown within the classroom as education needs to have an ethical position - not only a rational teaching of methods and facts, but also it should touch upon the upbringing in both the global and the local community.

- Local communities (see previous question) will be a good idea~!

- Accelerated Mode - if Europe reached already the turning point for the social movement in turn of the purpose of Changing Learning and Training.
As I agree it has not, we have to keep efforts on making better with less money - as it is demonstrated that the increase on education national budgets is not bringing better education - and making more collaborative actions, approaching Business to Education.

- To achieve this there has to be first and foremost a political and societal recognition that the current model of education no longer works. That is fundamental - so it has to break down before it can be re-built.

- Mientras las politicas educacionales apoyen fuertemente este intercambio de conocimiento entre culturas y los profesores hagan su parte disponiéndose a ser promotores de esta apertura y flexibilidad con una actitud de colaborar y entregar conocimiento

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generosamente a la comunidad.

- People need to be encouraged to become more mobile, to be interested in different cultures and experience themselves what it is like to be different. Inter-cultural exchange, global mobility and worldwide friendships should become something normal and enriching for everybody's lives. Languages are also a key to transcending borders and understanding better the perspective of others. In all this, the internet is a great tool that makes it easier to establish and maintain international ties.

- This can surely be achieved if there is, first of all, a good system of diploma/studies recognition for foreigners. Also, a strong and promising economy will easily attract people from outside the country.

- Training and collaboration with other colleagues in the field

- It has to be a top-down approach, driven by political commitment for an open and tolerant society! This would be a long process but in order to succeed, it has to be consistent and determined.

- Strong policies that influence daily processes.

- It will come by itself

- High status, high quality training of teachers and selective access to the teaching profession will be one important prerequisite. High status and high quality training of school leaders will be another.

- Continued dialogue and a welcoming approach to life

- It is the future, otherwise we shall continue to have racial tension within our communities - especially inner cities

- Strong media and political involvement in providing a positive image of "the other" (which is not happening, especially in times of crisis)

- This will be critical. A diverse group of students and teachers are needed to ensure this. I believe in quotas to guarantee that there is fair representation at all levels of the educational system. There also needs to be programmes which encourage under-represented groups to go into the teaching and academic professions.

- Yes, a cultural exchange is very important because of our multiculturalism and therefore we need a political agenda as well as enough participants who are open and flexible.

- And it needs to embrace inner differences of learners in addition to the external diversities.

- I am studying several didactic cultures to understand how this can be achieved

- Teachers training is crucial, more dialogue between institutional actors and the culturally diverse communities so as to understand their specific culture and needs for adaptation. Multi-culture specific teaching material would also be needed.

- Teachers should be able to deal with a lot of different people. They should be able to do that now as well as in the future.

- Cultural difference will become a major issue in the near future, but round 2025 it is an all included topic.

- It will come naturally as people get more mobile, migrating everywhere.

- Formal and informal learning anywhere, anytime

- I agree, but there is little political leadership in the United States, and I doubt this can be achieved by 2025.

- By perseverating in proposing awareness raising campaigns, successful experiences, gratification and rewarding mechanisms for teachers who accept to be more open and flexible, by mobilizing families, foreign communities and students altogether to then being able to lobby with the political levels.

- Reforming university curricula for educators and teachers

- Staff at educators need to be a reflection of the target audience

- Through training, networks, collaboration and partnerships supported with multicultural activities

- Definitely so

- Giving the same opportunities to everybody, independently from the cultures they belong to.

- - Better teacher education
  - More focus on Sensibility rather than on Intelligence only.
  - Create, foster and harness appropriate Love in the domain of the Educational Institutes.

- Diversity breeds creativity - but also can also create tension. A danger of formal education (teacher/class) is that it has the effect of homogenising groups: the class conform to the teacher's idea of 'what is right' (or 'what is right' at an institutional level). To develop a truly diverse education system, debate needs to exist and be encouraged at all levels: in art subjects 'group critiques' are well-established - if this type of group evaluation was encouraged wherever possible throughout education, then difference will be valued and recognised.

- Greater mobility for learners and teachers

- THE ROLE OF TRAINING TEACHERS IS BASIC IN THIS PROCCES

- Strongly agree - but I really don't believe that this will happen before 2100. Think about the power of the church and the teachers-unions in the field of formal education. Nothing will change such "fast".

- If more public debate were used for education in school students would not be so ignorant to current social issues.
  Our school today avoids important issues like immigration, religious tensions and how much tolerance is acceptable before it becomes ignorance

- Gainsaid. But diversity must go beyond ethnicity, race, sexual preference, etc., to include 'new minorities' evolving in real space and cyberspace.

- The principles already exist. The core values of the French Republic (to speak of what I know), for example, are just fine. The teachers I know in the most multicultural areas of the country are mostly open and flexible.
  The deficiencies of inclusivity are due to lack of resources and ghettoization of neighbourhoods.

- Only by participatory process a co-design may be followed by leadership.

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Comments by those who agree

- Leadership is necessary (maybe not purely political), as is flexibility.

- I wouldn't know. It's a bit vague the question.

- HR management... ;) And maybe a teacher education like Finland has: only one on ten candidate-students get accepted -> rethink the role/profile of the teacher and his/her management -> leadership without fear, maybe more disruptive change is needed.

- Society is becoming international very rapidly. distance will more and more be of lesser importance

- Education should be de facto accessible to all - currently it is not designed in this way. Change will come about by implementing a broader vision of education and reducing the need for exceptions.

- Correct but must also address the disability need of all categories of learners

- Pretty much, but we also need to recognise interest-driven learning and the diversity of learning strategies that young people have rather than the militaristic drilling of fact-based curricula validated by high-stakes assessment as a singular model of authentic education.

- The risk is that there are countries in which these objectives are already underway and others that will not fit so easily.

- Sim concordo. Torna-se necessário encontrar o equilíbrio entre um forte liderança política e o consenso de todos os educadores. É com os educadores que os políticos têm de contar e não é criando um conflito aberto com eles que se consegue contribuir para uma educação inclusiva.

- Do not know what is meant exactly with strong political leadership.
  Yes more openness and flexibility are generally required in modern times and increasing influence / interconnectedness of online and offline worlds.

- Jointly debating the needs for education

- Mostly, yes, as a means for developing a competence for dealing and behaving in multicultural contexts, but no in an absolute sense (cultural diversity as a richness factor to counterbalance standardisation trends of globalisation but not as a de-contextualised "neutral" cultural relativity).

- It would be wise to consider this more from a psychological and pragmatic perspective, rather than from a political perspective - the richness of diversity in education is broader than ideology - it is about fostering our thinking skills - so, yes to openness and flexibility

- It will require the dedication of all people involved. But you can't force that.

- This is the world of today and it will not change, so we better live with it and make it good.

- Gradual persuasion and some better leadership

- The interconnections of many of our communications and social systems have become increasingly global. Global input to education may well be less threatening than inclusion of local sources of mixed culture.

- Internationalization represents an important trend in education, the student being expected to have been exposed to other cultures and countries.
  This can be achieved via the development of exchange programmes, and the set-up of alliances between organizational institutions from different countries. (the use of online technologies will enable it, and in particular will make it cost effective)

- Again - these are two statements
  1. It needs to embrace mixed and multiple cultures
  2. It needs leadership and openness
  You need to separate these out.
  In response to 1. Yes it will require mixed and multiple cultures, the challenge will be to enable young people to regularly encounter difference, reflect upon it, and also recognise their own unique contributions. This requires both pedagogic and curricular change. Best insights into these arguments are, I think, Gert Biesta's 'Beyond Learning: Education for Democratic Future'

<div style="background:yellow">**Comments by those who are not inclined either way**</div>

- It's a self evident statement, and is therefore not credible.

  It no doubt requires strong and principled political leadership ... what doesn't? But it also requires strong and principled educators, and open and flexible political leaders.

  Critically, what we envisage requires revolutionary - not evolutionary - politics. It could be argued that no politician is going to suggest such a fundamental transformation, let alone allow others to do it for them. Do we then need to think about new modes of government? Or do we need to consider the possibility that key public services like education are taken out of central control, freeing them from the electoral cycle of democratic political competitions?

- This statement contains too many issues at once to be for or against.
  1. "For education to be inclusive in 2025, it needs to embrace mixed and multiple cultures". This is nothing new.
  2. "This requires strong and principled political leadership at one end" (this is nothing new)
  3. "Greater openness and flexibility amongst educators at the other." Why?

- If by 'culture' you're talking about religion -- there's NO PLACE for religion in education anywhere unless you're teaching children comparative religious studies (and including ALL of them). Religion is divisive and it robs children of free will and undermines the natural development of critical thinking. I doubt we'll still be constitutionally protecting it by 2025. We'll most likely have 'grown up' by then.

- This process needs more decades

- What range of education is meant? What is meant whit inclusive? Political leadership off course plays a role, but I guess it is a wrong assumption to state that politics has much influence

- "Inclusive"? "Mixed and multiple cultures"? Again, I'm not sure what either of these mean.

Everyone goes to school in the US -- if that's not what they mean by inclusive, then that statement just isn't clear. And US students are made up of many different cultures -- do they mean that what will be taught will be done through the lenses of different cultures? That I seriously doubt. Even though a weak attempt at that was made in Texas recently (with some good arguments explaining the approach), it was mocked and ridiculed by academics instead of approached as a different lens.

- For starters, it depends how important "inclusive" really is or means. If regards knowledge, it is important to break the current learning (not teaching) mould. How important is strong and principled political leadership to achieve those goals remains to be seen.
- Not sure what cultures are being talked about here.

- The statement may be incorrectly formulated... What is "cultures" in that sentence?

  Mixed and multiple scientific cultures makes sense. Ethnological cultures don't much more sense than today. It'll stay complicated for a century or 2...
- Education will become segmented according to society values, political believes...
- Makes sense, but I am against making this mandatory. There must be options for mixed and multiple cultural educations, but not mandatory.
- Embracing mixed and multiple cultures is essential but must be done with balance that does not make the indigenous population feel threatened. More sensitive management would not have given rise to the BNP
- I do not think we can imagine any actor having a central role in the educational process(es). Political leadership should facilitate knowledge exchange and help communities to keep their cultural richness alive and available to externals.
- If inclusion is to take place you should trust the learners to mix with multiple cultures, political leadership is not necessary there.
- Again, a nice-sounding statement that is too vague to be useful. What does embracing multiple cultures mean and how does it differ from what currently goes on in school? Multiculturalism is all very well but not if it results in economic disadvantage as well-meaning educators fail to develop the language skills and cultural knowledge that allow incomers to flourish in the recipient society. And treating all cultures equally in terms of time and attention can mean treating none of them adequately, and lead to a desperate relativism.
- Not in short term, too many changes in few years. Rethinking and reinventing process needs lots of time.
- This is nice in principle, but there are many societal pressures going the opposite direction, particularly in the U.S. Look at the recent moves in Texas, where the state school textbook committee is writing the founding fathers' Christianity into the curriculum. While some cultural inclusion occurs, education often serves to initiate the minority or underserved into the majority's cultural framework.

- Political control over education serves no other goal than that of the state. Education should become a free-market where parents and students can pick what they want. Teachers who want give traditional lessons specialize in that niche, and democratic and special needs teachers in theirs, No need top-down forced changes, and it will bring out the best of each education practice
- Bueno esto no es mi área, pero seria bueno con estrategias pedagogicas de acuerdo a psicosocial del student
- I do not believe in mixed cultures.

3.2 Comments on the second statement

> *"Collective learning (i.e. learning in networks, where learners teach each other) will not benefit all groups of learners. In particular, fragile groups will have difficulties with such a system."*

<div style="background-color:green;color:white;text-align:center;font-weight:bold">Comments by those who strongly agree</div>

- I don't think it is "fragile groups" in particular that are disadvantaged. Rather, "collective learning" needs to be learned as well and many groups display dysfunctional interaction patterns that are beneficial to some of the actors involved, and detrimental to others. Therefore, communication and collaboration skills as well as reflection, self-assessment and management skills become more important to enable learners to benefit from collective learning opportunities and experiences. Furthermore, most learners who are in the initial stages of a learning process and do not yet "know their way around" profit more from some guided intervention, as compared to unstructured collective learning experiences.

- Self- and peer-organised learning calls for social confidence and skills (e.g. writing, understanding different points of view) that may not be present in every learner.

- And there will be solutions also for them

- Self-learning and peer learning are critical. You only have to refer back to popular early childhood education systems such as Montessori to understand why they are so important to development.

- In this system, the stronger learners will get stronger, the weaker learners will get weaker.

- See earlier comments.

- and there will be solutions also for them

- People are different. My feeling is that socially and emotionally skilled individuals benefit more from collaborative learning, even though online learning environments generally evens the playfield for individuals with less skills in these areas. As you note in your question, there are many other aspects that may render individuals and groups fragile and thus at a disadvantage in a collaborative learning situation. This sort of learning method could be used to develop desired skills beyond the primary topic at hand, although with caution and care.

- Mein Gott, Ja! Damaged and otherwise limited students who cannot/will not self-educate or work in generative, diverse, and innovation circumstances comprise at least 50% of students. Inroads can be made in this metric, however.

- I believe a reduction on collective will be harmful for all learners. It is not only the problem of fragile groups but as well a problem of fragile situations in strong groups and implies always the risk of loosing the way.

- One specific type of learning will always provide benefit to a particular group of learners. You need to support different types of learning to accommodate the range of learner types.

- Sim é verdade, mas cabe às redes de aprendizagem encontrar maneiras de chegar a esses grupos mais frágeis do sistema.

- Some pupils cannot handle that, but only a few.

- Hardly anything ever helps everyone, and new methods and context will create difficulties to those that thrived on the old methods and can't (or won't) adapt.

- Collective learning - whatever that may be - is a pedagogy and one size definitely does not fit all!

- Collective learning is very sophisticated; it requires many skills and a collective mindset.

- Obviously a weak group will produce less knowledge

- That's true; we need to strengthen the ability of group-work or collective learning, not only in learners but also for educators so there can be functional and good cooperation between institutions.

- Bildungsferne Gruppen beherrschen das Instrumentarium nicht und haben häufig auch

keinen Zugang dazu-.

- The rising presence of utilitarian and 'working world / core skills' discourse damages the fabric of universal provision and will continue to do so.

- In the end (almost) everyone will adjust (looking at youngsters now)

- Posiblemente estos futuros centros de conocimientos deberán organizar a sus comunidades de manera de que las más frágiles sean apoyadas fuertemente durante un período de años hasta que estas se fortalezcan. También se pueden crear grupos de apoyo a estas comunidades más frágiles que se instalan en ellas por períodos de tiempo.

- The risk in self-guided groups is that the direction is not well sure.
  You need a leader, either formal (the teacher) or informal (the most charismatic in the group).
  Moreover if the level of learners is not homogeneous, it will be difficult to keep it working on time.

- This is one of the reasons why I believe that schools will remain distinct institutions and why teachers will have to create learning situations for students with different learning abilities also in the future.

- Culturally there are many societies within which this is misunderstood technique. the hierarchal nature of certain societies naturally lends itself to the western business school approach

- I like group learning, but it cannot be the only mean of learning. There are always group dynamics taking place (like: the leader merging and talking all the time, etc), so from a pedagogical point of view mixed learning activities are still to be preferred. This does not mean that collective learning should not be encouraged, but just that individual learning has to stay as a part of the learning experience. Also to give time for self-awareness and own reflection.

- Hmmm, there are always some problems concerning motivational aspects or low media-skills.

- There are always different styles. Complex learning is needed; differentiate in the way you work with learners on all levels.

- Consider for example the difficulties of evaluation

- Is always very helpful if respect for the fragile groups is sustained

- Some groups will need more support and structure than others

- COLLECTIVE LEARNING, IF WELL CONDUCTED, CAN BENEFIT ALL KINDS OF LEARNERS

- Differentiation is always needed in Education

- Each learning type has its objectives. Some will need more individual training, as is also the case today.

- As usual, some of the groups will be excluded, mainly because the attempts to use learning in networks will lack competencies of the teaching staff, as well as the motivation of the students.

- If left unmanaged and undirected, such groups would only suit the intellectually able and socially competent learners. For them, these networks would be important, and the fact that learners of other abilities cannot use them should not mean they are not available. While we work to develop an inclusive education system, we should be very careful not to use the average as our base. Inclusive means inclusive for everyone, not just those at risk of exclusion, if you see what I mean!

- What is a "fragile group"?
  Already we know that "collective learning" has its drawbacks. That is nothing new. In a group the slowest hold-up the fastest or the fastest leave behind the slowest.

- Fine if the lessons are appropriate and collective participants are all ethical. You can collectively learn negative behaviours and knowledge as well as positive, particularly under peer pressure and bullying such as experienced on social network sites

- Unbalanced networks might be affected by a sort of "digital knowledge divide". This might prevent impaired communities from having access to the same knowledge that their peers belonging to luckier communities. Such lack of permeation would create a difference in the opportunity to learn from peers when you belong to one or the other type of network.
- It's not at all clear what is meant by 'fragile groups'. But all groups will suffer if they are deprived of input from skilled teachers. Peer to peer learning can be a powerful tool but only in a context where it is not the only method of learning. You can't, for example, rely on peer-to-peer to allow learners to move up their ZPD.

- No single approach to learning fits all groups but fragile groups can still benefit from communities helping each other. As the online social space matures, it is becoming obvious that their are many potential and willing teachers on the net. They can also help fragile groups.
- Depend on the synthesis of the groups ad the effective or not handling of the condition by teacher.
- Don't really know but it might be possible. I guess there needs to be more research done in this area.
- Probably a mix of techniques will coexist to adapt to the needs, culture, etc of the learners.
- I guess it depends on how the collective learning is organised: being aware of the presence of potentially weaker groups, the learning process should be structured in a way to address their special needs.
- All learners benefit from articulating their ideas and thinking out loud, but 'collective learning' requires very careful management. Differentiation is the key here: and variety. Collective learning should be one of the ingredients not the only ingredient. Again, it goes back to the skill of 'learning to learn' and also the role of the teacher as facilitator. Left alone a group of learners can propagate myths and misconceptions. However, if facilitated (and this could be online), discussion and collective learning techniques can help surface misunderstanding, provide greater challenge to learners, and support differentiation.
- It depends on how social learning is organized and prepared
- No method of teaching should be exclusive, because no method is perfect for all learners. Now, in my practice and in my environment, collective learning is still underused and should be encouraged.
- Initially this will be the case. It is up to education to provide as much equal opportunities to everyone as possible. And... to adapt to the learner. So yes, probably true although might need some nuances.
- There will still be those who are hesitant about the ability of technology to effect positive learning.
- What are fragile groups? Socially excluded groups? Then this is completely wrong. Socially inclusive learning comes from building a strong collaborative process built around shared interests not given curricula. On the other hand all learners have different styles and we shouldn't priviledge any one style over another.
- Yes, I understand this argument. I guess the fragility has to be solved in advance of joining collective learning groups, so in more basic education and training, or remedial programmes before joining in. But perhaps it is also a question of being confident about this new type of learning and making a first step helps to enter the process.
- I'm not sure what these 'fragile groups' are.
- That will be true in some instances, but in others collective learning may provide a safer haven for fragile groups since they can participate somewhat more anonymously.
- It depends on how the collective learning is structured and managed.
- "Learning networks" sounds time consuming. Information will need to be synthesized more in the future. I don't understand what is meant by the reference to "fragile groups". I believe there will be lots of flexibility to 'opt out' of groups if there are personality clashes if that what this person is driving at.
- Efficiency of learning in networks to great extent depends on aims and motivation of the

core team and participants.

- Why are fragile groups? Why are they fragile and why is networked learning for them different that 'traditional' learning?

- Unless they tell me how these collectives are formed, I have no idea how it will go. For example, if they are voluntary and formed through authentic need, then they will succeed. If they are forced, then probably not, especially for these so-called "fragile" groups.

- It depends on access to technology.

- Estoy en acuerdo y desacuerdo, el papel del profesor en hacer que el estudiante aprenda y desaprenda o habría problema si sabemos majar bein nuestro rol ;-)

Comments by those who disagree

- It is not clear what is meant by 'fragile' groups but if such a system was established it should be designed to meet the needs of all.

- They will benefit, it is just that they may need more support. However there is no reasons why this support couldn't come from peers within the network itself.

- I believe fragile learners will gain more from collective learning, if adapted and with a coach ore some better learners joining.

- I think that they will always benefit learning. It is merely the way that when these situations are organised the special demands should get extra careful consideration.

- On the contrary. Less political boundaries and flexible learning will let larger- and even fragile - groups to participate.

- This depends on the awareness that there will be need for new structures.

- Fragile groups are mostly likely to benefit from such a process, providing it is properly managed.

- I think connectivism is already quite popular even if unconsciously. Unfortunately little is used in learning institutions.

- Yes fragile groups will have difficulties, extra efforts will be necessary to develop inclusive ways of collective learning. But these developments can not be stopped.

- Fragile groups will certainly need additional support, but inclusion in learning networks is the condition for their further social inclusion.

- Collective here suggests unstructured. There are learners that require open ended assignments and courses and there are learners that requires clearly structured assignments and courses, this does not have to do with collective learning per se, but with the way assignments are organized - think of Aronsen's jigsaw classroom.

- That really depends on how collective learning is organised and facilitated. Learning in networks is not necessarily identical with collective learning. Learning networks can be very flexible, and by the use of proper services and ICT in particular fragile groups could benefit.

- What's a fragile group?? Can a collective learning community create flexibility for "fragile" groups? I think so.

- The benefits are more than the problems in my opinion.

- There is a danger of this, but there is some evidence that in fact "fragile groups" or underserved communities may benefit more. There is a wide range of niche materials and information that might unite and benefit previously excluded classes. This assumes, however, that there is some parity in access to technology and information.

Comments by those who strongly disagree

- There are plenty of studied cases showing realistic better results in fragile groups (Equal Initiative Programme).
  Acting locally and enabling access will allow innovated solutions.

- These fragile groups will have more to earn from this type of learning than anyone else: they will have access to a very large network of people like them or people that can help, they will share their experiences and feel at ease with the great number of people like them, the bonds between them will surely be strengthened.

- I sustain the necessity of tutoring, always.
- Collective learning works as long as the pedagogy behind it is solid and planned in advance (see CSCl macro micro scripts).
- Different preferences in learning create different learning processes.
- Ehm...allow me to note that all individuals (including teachers) have their own best specific way of learning things. Due to practical and economic circumstances we can not cater for each individual's specific style of learning. With the Myers Briggs Type indicator method for example one can easily see how people differ in their learning behaviour.
  So it is not the fragility of the group that will determine the success or failure of collective learning but the personal traits of the individual teachers that participate in such a network.
- Experience in democratic education, by example in the slums of Givat Olga, Israel shows that the contrary is the case, fragile groups profit from such systems, as they can show their talents for the first time, and realize how special they are. On the other hand, it should be left open to follow traditional lectures for those who want.
- Individual learning will have to be monitored by the teacher, students still need 'external' motivation to get the best out of themselves.
- Don't know.

3.3 Comments on the third statement

> *"In 2025 technology will be more important in education than it is today. This will lead to a widening gap between those that have access to educational technology, and those that do not."*

Comments by those who strongly agree

- Ongoing process.
- [There are two statements. I agree with both]
- Closing the gap calls for government spending, difficult in times of economic stress.
- True. Totally new ways of learning are evolving which are directly linked to software, hardware and communication devices. If you don't have access to these, you will miss out on knowledge, new ways to collaborate, productivity and efficiency.
- See earlier comments.
- The trick is to close existing gaps ASAP. This will mean cheap smart/intelligent pads, cell phones, etc., for everyone.
- There is nearly nothing to explain if you see that you will need information technology to organize the learning process, to get in contact with all the dispersed institution and persons which are part of the curricula, to use augment reality systems, to use blended learning systems, ...
- I am afraid that is right. So we will all have to prevent that from happening.
- Especially for rural population or young / older learners the gap will become relevant.
- Technology can be liberating but it remains expensive and narrowly conceived and poorly used in the learning world; my concerns would be that this is an actualising process.
- Esto es lo que hay que solucionar lo antes posible, democratizar la educación debiera ser la principal preocupación de los actuales gobiernos. Los paises con más recursos deberian proveer a los más pobres en tecnologia en retribución a la explotación y expropiación de materias primas que actualmente realizan.
- I would say this is obvious.
- Yes, of course technological advances will increase. And we have to avoid the digital divide.
- The statement is seriously connected with the evolution of technologies ant their cost and modality of access.
- The use of ICT is being pushed as more and more applications are only available online. The infrastructure needs to follow to ensure everyone has equal access.
- This is where governments may play an important role to bridge the gap.
- Also in this case, the digital divide is a huge risk. The more knowledge and education rely on the tools used to vehicle them, the more the possibility to access those tools will have an impact on the ability of people to access education.

- CALIFORNIA HAS A BIG PROBLEM IN THAT AREA: NOT ENOUGH TEACHING IN PHYSICS, CHEMISTRY, PHYSICS,...
- Technology shapes the world we live in and people without internet are cut off from a huge amount of information even today.
- Besides, the social gap is widening and money makes a lot more possible in education.
- It will be important to have the access to the right technology, and on time.
- The trend is already visible. society will have to launch an offensive to counter this.
- People of a certain age and above some teachers are not yet able or willing to use it.
- Probably, as it is actually! There's no news in that statement :/
- It will be like families with licensed parents or with more economical resources. We have to focus on solutions that will include and not exclude and technology is bringing more people for better learning and not the contrary.
- However we must be conscious that there are limits and constraints and that investment must be available for the important roles:
- Learning Leadership
- Teachers
- Environments and rich learning contexts
- Local interest curriculum and courses.
- Programming and software are already included in many US schools.
- This is an obvious statement. At the same time I do hope / expect technology will be accessible to more and more people across the globe.

- As access to educational technology will become more accessible faster than the relative importance, the net effect of technology should be towards homogenization (something that is different than saying that there will be increased homogenization).
- Strongly agree on increasing role of technology. Not sure about access.
- Yes, but in the long term this will hardly be an issue.
- There is a gap today.
- Whether the increased role of technology in education will lead to a wider gap depends on the scenario for the future, and the policy support for this topic. At least the risk is there.
- It's still just a tool - albeit very useful. The demise of the book and the pen is not imminent!
- Somehow agree, although this is a matter mainly for governments to make sure the access and use of technology is freely available to everyone. I believe technology will be an important factor in the way education will be shaped in 2025, but technology will only be an enabler. Cost of the technology will go down significantly and therefore it will make it accessible to a mass market. Changes in usage and attitudes would be more important factors (and barriers) in providing wide access to education. The focus for governments should be in making sure they prepare people for the upcoming changes and transformations in order to ensure equal access to education for everyone.
- That is quite obvious although it must rather refer to societies from different regions of the world than to groups within the same, quite homogeneous, society such as the European ones.
- As the use of technology increases and 'new' technologies become ubiquitous, so education will have to keep up. The technology I encountered in classrooms was typewriters and BBC Bs. Now classrooms are equipped with interactive whiteboards and each pupil has more computing power in their mobile phone. There is already a huge divide between those with ready access to technology and the internet and those left behind - this can only become worse: and the poverty of access will lead to communities that are effectively 'cut off' from a virtual world and limited to their own locality.
- It will not widen gap but I believe it will make knowledge more accessibly to people even from the remotest parts of the world through diverse products coming into the market on a daily basis.
- In the UK, schools will continue to resist technology use where an "in loco parentis" responsibility exists along side league table. In all other areas Personalised Learning Environments will blossom and HE learning strategies may become very diverse using "collaborative networks" to support self-organised degree programmes.
- Yes, that's a risk.
- Technology will almost certainly be an increasingly important element of the educational arsenal. While this could, and sometimes will, increase the gap, in other instances technology will provide lower cost alternatives to educational access that will compress

current gaps.

- A number of people (including teachers and academia) do not like advanced educational technology.
- Because technology is becoming more important in life, in society as a whole, and education should reflect society.
- Agree - though policies should be in place to accelerate the uptake of technology in developing countries.
- For all the reasons that are true for the digital divide in general.
- At the same time: good teachers - even if not technologically up-to-date - are invaluable. Schools should find good positions or jobs to keep them and use their experience and skills.
- It will be more important in life and as such also more important in education. This gap is already there and it is already large. I think it is more likely that this gap will decrease in time as the required technology becomes more affordable.
- This is one of the most important points and the most crucial role for today's governments and educational leaders, to ensure that underserved groups do not fall further behind. I believe that properly implemented educational technology can in fact level the playing field. Technology is becoming cheaper and more widespread. It is my hope that stakeholders ensure all students have access to technology, but this will mean champions and leaders will have to make this happen.

- Being able to work with educational technology is something one can learn quite fast. So this shouldn't be a big problem.
- Não concordo. É verdade que quem não usa a tecnologia, ou quem não a tem, constrói um fosso enorme entre os outros, mas a caberá à escola intervir no sentido de colmatar essas diferenças.
- Yes technology will be more important, but it will be also more affordable by the different population.
- The most limiting factor is related to the competency of the staff, and their likeliness to adopt new usages.
- There's two parts to this, thus my response.
- Technology needs to be more important. It couldn't be less important than it is now. Education is technologically impoverished at the moment because it refuses to transform. But transformation will become unavoidable as the learners and their sponsors (parents) demand it.
- As for the widening gap, this assumes that we are proposing a global education system. Differences between Angola and America, Ethiopia and England are inevitable and cannot be the subject of our energies as educationalists. Our focus is the developed nations, in my case, the UK. There are few kids - even from the most impoverished families - where they don't use mobile or games technology at home or with friends, or where they don't have access to PCs or whiteboards at school. By 2025, I envisage we will all access our public services, including our learning curriculum, via some national online portal through any enabled device.
- Well, it depends on what technology. Expensive technology: yes. But cheap commodity technology: no.
- The importance of technology is increasing since the beginning of technology, so yes, it will be more important in 2025.
- That by itself doesn't mean anything. It depends on what people can and cannot afford. That has always been a constant factor and that will not change.
- If we consider basic PC and Internet as educational technology, I would agree. However, research (based on PISA data analysis) also shows that having PC and internet access at home influences more the student educational attainments than PC / internet access at school. Thus, measures to reduce household digital exclusion are crucial.
- Well, this is possibly a matter of facilitation for those who want to have access (as well as to education in general).
- There are two different points here.
- I don't think it is possible to forecast that technology will be more important in education than today, this depends upon a whole load of variables, including peak oil, climate change, resource scarcity.
- 2. Whatever happens with technology or without, all the trends point at present towards widening gaps between rich and poor, and without concerted efforts to tackle this, education

- will reinforce those gaps through technological divides and others. This is the issue that needs addressing.
- This is not new, and has been a challenge since the industrial revolution. Since then we proved to be able to increase the % so why not now?
- La tecnología será muy importante pero no indispensable, de hecho la pedagogía es indispensable en la formación, algunos años atras tuvimos en fracaso del elearning por esta razon (darle más importancia a la tecnología y no a la didactica y pedagogía).
- This is not necessarily true but may be a problem. However solutions are possible with humanitarian interaction.
- Agree to first statement, not with second. Technology will be available to all and it will be much more common to use and rely on technology.
- the institutions will surely have at least the role of providing the tools
- Yes and No. I will half borrow from Albert to explain:
- "Science and technology might take you from A to B. Imagination and drive will take you everywhere".
- People can do much more than they think right now with a lot less. In my view at least.
- All things are possible here and it depends on what we mean by educational technology.

<div style="background-color:orange; text-align:center; font-weight:bold; color:white">Comments by those who disagree</div>

- The web is quite well disseminated, and especially in 2025. I hope the Web will remain cheaply available everywhere around to world to provide the same opportunities to online learners.
- Technology will become a commodity and available for everyone. Here is the role of governments.
- If to be a public facility. We all benefit!
- I believe that in industrialized countries nearly everybody will have access to computers and internet.
- Actually I think it will be less important in the sense that it will be taken for granted as a way of doing things - as already happens in some of the best schools. While there might always be a gap between leading edge and the mainstream it is silly to project current concerns about the digital divide, already declining, some 15 years into the future.
- Education will still be important but adjusted and powered y technology.
- To my knowledge, the price of access to information technologies tends to decline. I have read several articles about the explosion of mobile networks and Internet in Africa. I am in contact with several people over the Internet in Burkina Faso. But the digging or filling of this gap is also a question of political will on the part of the northern countries.
- By cons, inside a country like France, I don't think the problem arises.
- A pencil was "technology" at some point. Almost all homes have computers. Every public library has internet access, as do schools. That so-called gap seems to be narrowing and not widening. The more people use technology, the more prices come down, and the more people will have access to it.
- It's easier bridging technology gap than providing access to traditional/formal education.
- Of course, there are objectively 'fragile' groups, but the definition of 'fragile' is often social-based and attached as a stigma, creating the conditions of a self-fulfilling prophecy —like with the Pygmalion effect... So if technology is used as yet another stigma, the prophecy might come true.
- On the other hand technology can be used by self-advocacy groups to promote their identity and their interests. Enabling technologies can reduce gaps.
- Also, what is the definition of "educational technology"? Google is a great educational technology, and infinitely superior to many of the officially labelled "educational technologies." World of War craft, Sims, Zoo tycoon are also great learning technologies, and they are accessible to most.
- May be should we focus more on 'learning technologies' (self-defined) than 'educational technologies' (externally defined).
- What will be more important in 2025 (hopefully) will be a better understanding of how learning can be maximised. That may well include the use of technology but it should not be premised on technology. Additionally, even in the poorest community's technologies such as mobile phones are in wide use - we should not assume such a simplistic divide.
- As the use of technology comes more wide spread, it also will become more every day like in general and easier to access and use even with the low skilled user.
- The importance of technology is clear, but the access to it is a clear must for the public

policies in order to ensure the right to education.

- Technology will be more important in education and in every aspect of our daily lives, and it also will be more than present all over the world.

- All will have access.
- Technology will become very cheap.
- ALL PEOPLE WILL HAVE ACCESS TO EDUCTIONAL TECHNOLOGY, AT LEAST IN COUNTRIES WITH A PUBLIC EDUCATIONAL SYSTEM
- It has already been shown that the net is extremely open and flexible and that this gap (which has been feared for a long time) is actually not there. Of course, some forms of educational technology will be expensive but technology is actually helping groups that have until now had no access to educational material what so ever.
- I hope technology will finally have an effective role in education. It's the other way around: education can help to *close* the digital gap. Just like it did with books in the past.
- Technology will be very important, but everyone will have access to educational technology by 2025.
- Disagree. Computing and communications technology costs money, but much less money than going to live in other places where the education is.
- Technology trickles down more and more, and the future of education lies in another paradigm about learning and humanity, rather than in technology, although technology is one factor in promoting such a paradigm shift by breaking down walls of class and culture.
- Everybody will have the technology for educational purposes.

Themes: (1) Re-integration into the labour market; (2) Re-Skilling; (3) Up skilling
Personas: (1) Sven, (2) Martina; (3) Slavi

1. Re-integration into the labour market

Sven is 42-years old and has spent the last 12 years raising his children while his wife worked. Now, he would like to re-enter the workforce, but the industry he used to work in, does not exist anymore. His dream is to open up his own childcare centre.
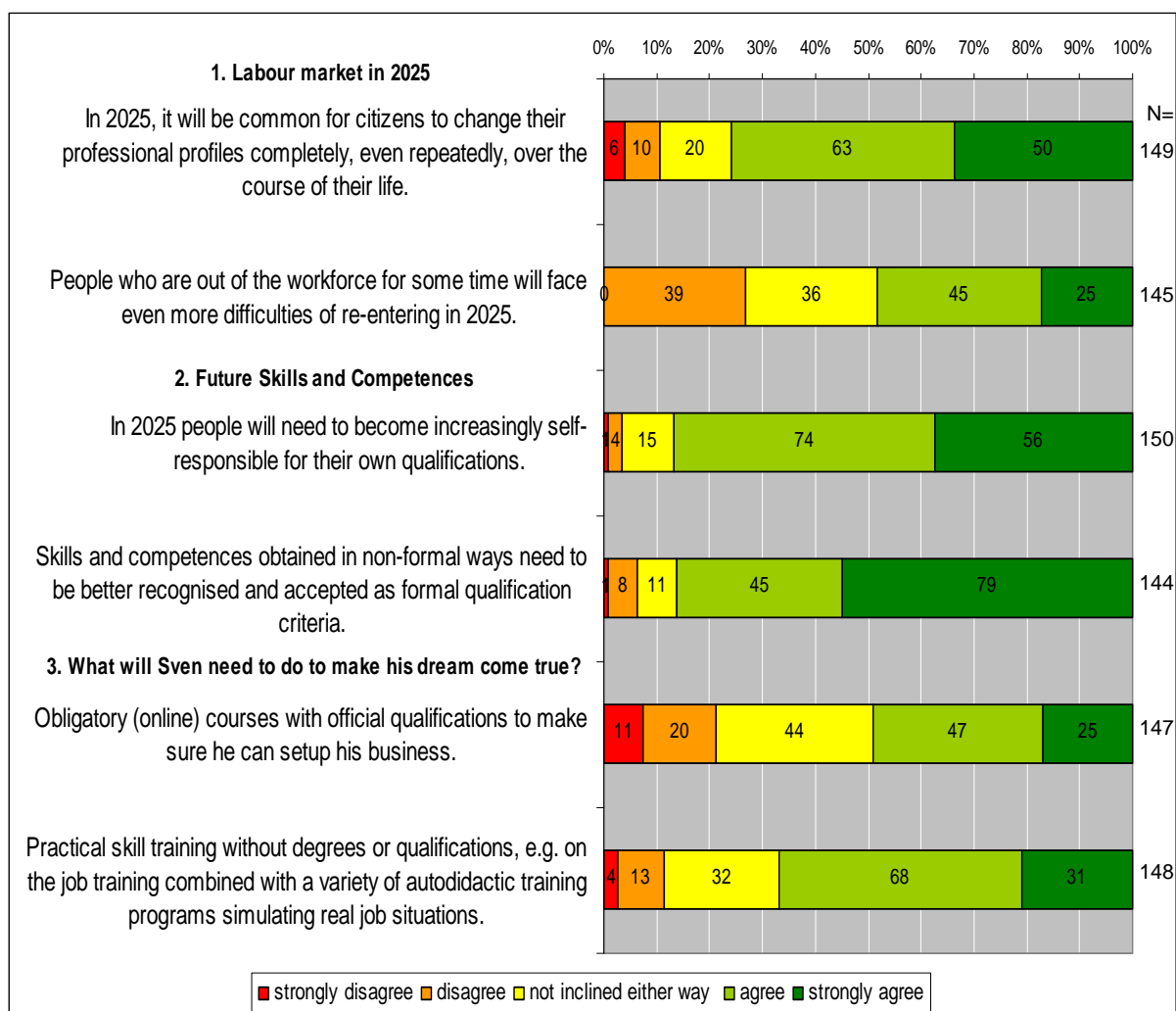
Figure 18: Results of online consultation (part II) on the persona of Sven (in absolute numbers)

Comments

- Childcare is a difficult topic to look at in terms of informal qualifications since all governments regulate childcare provision and all parents look for as much reassurance as possible when leaving their children with someone else.

- People will come to expect professionals to be trained in the area they operate in.

- Sven is a European citizen, for me.

- Do not rule out formal, accredited face to face training with assessment and certification - this will always have a role.
  Also, while those at work will re-shape themselves over time and may have a number of careers throughout their working life, those who exit the workforce for any period of time will still find it difficult to re-integrate. That's a problem now and I don't see it getting better in 2025.

- Hopefully, we will know more about learning and how to evaluate experience by 2025. There is a trend toward internships and practical experience in many professions which could result in new criteria for qualifying for a position. Even volunteer and activist initiatives might be considered.

- A slightly odd example to choose to begin. It tries to make an unnecessary point about gender equality but ignores questions of how we should regulate that kind of enterprise. Establishing a childcare business for a man would be doubly difficult and the idea that this could/should be done without formal training and accreditation in child care and without guidance in starting a business is unrealistic.

- I wouldn't have asked question 3 that way. We need to dissociate learning, formal and informal, from accreditation and qualifications. So people must be able to choose their preferred way to gain recognition (again, formal and informal).

- The labour market is likely to remain as differentiated as it is now with some people being very flexible, mobile and self-learners while others for lots of different reasons are still in much more traditional patterns. If mechanisms of the NQF type have become common and workable then they should help to increase the recognition of experience (with RPL mechanisms also) but it is very hard to estimate the extent to which they will be workable, used and realistic. In our country these things are already obligatory and I do not think this will change much.

- It is important to state that the ability of people like Sven to enter a new, different market do not only rely on their actual skills and knowledge. Many other factors have a strong influence on whether an "adult junior" has access to a given job, including (but not limited to) the cost (cost of labour, salary expectations, lifestyle) that hiring adults have with respect to hiring young people.

- People are always and at any time (now, 100 years ago and in 100 years) responsible for their qualifications.

- About what country are we talking here? For example concerning q.1, there are huge differences already between USA and Europe, as well as within Europe.

- Question 3 provides training solutions - there are a variety of other things he will need to do to make his dream come true, not everything has a training solution.

- Maybe Sven should choose something else. Education/childcare and business will have separate paths even before 2025.

- Agree or disagree does not imply that I like / dislike the options, just I believe that is the most likely.

- Regarding 3: It cannot be either/or. The option I miss is practical skill training with a theoretical background: why am I doing what I am doing and are there other (better?) ways to do it? Theoretical background can be obtained online, or preferably in discussion groups with practitioners, discussing theoretical insights and their value in practice.

- People should learn more about mastering the intuition and then act in concert of what the feel.

- Sven will need a system able to support-validate either certificate his experience and proficiency in order to facilitate his re-entering to the workforce.

- I think that diversity of approaches and styles will more likely than not be the order of the day. It makes sense to me that Educational trends will have to follow general trends in society as well. I.o.w. diverse, flexible and probably fairly complex solutions will be the name of the game. However, technology in whatever shape or form will be part of the solution sets that we'll have to explore as groups and as individuals.

- I think mentoring/coaching has been overlooked in the range of options open to Sven. Equally overlooked is Accreditation of Prior Learning (APL).

- Sven should be able to tailor his learning and his business to the needs of himself and his identified market through a wide variety of options.
- What languages does Sven know? Perhaps his future enterprise uses other languages than Swedish?
- You should have chosen another picture of Sven (it looks like his hand is someplace else than in his apron...).
- Regarding question 3, my personal feeling is that obligatory online courses will be what are offered and asked for, but on the job training and an autodidactic approach would support more relevant learning.
- Courses, obligatory or not, should not only be online, direct contact must remain available. Course design is extremely important and it should be much more user-oriented.
  Entering the workforce is increasingly about personal contact with the culture/the people/the company. The fact that internet and social software provides open opportunities for these contacts does not mean that entering them is easy for everybody.
- Official qualifications are essential. Q3 should acknowledge other ways of becoming trained, such as through official qualifications delivered in other ways.
- Both practical skills and official qualifications will be needed. In some areas even the practical skills will be evaluated most important.
- I don't see an obvious match between what is proposed in 3 and the evident problems raised in 1 and 2. There is an alternative scenario in which Sven takes a more active role in personal learning, in a networked society supported by peers. This may or may not involve some formal elements, but mainly to have his skills formally recognised and certified.
- The example is difficult and very special because Sven will work with non-adults. Non-adults can assess if he is sympathetic, empathetic, interesting or entertaining. But they can't assess the full range of qualities his offer should have. That leads to five points in the category 3 "Obligatory (online) courses ...". If he would like to open up a furniture design centre I had given only one point.
- 3 c would be something between official qualifications and training without degrees or qualifications. = I strongly agree.
- Official qualifications combined with practical experience are something that will be of outmost importance.

2. Aspects of Lifelong Learning: Re-skilling

At the age of 59, Martina has to realise that her high-powered career as a computer engineer has come to an end due to the rise of new technologies which render her expertise obsolete. Martina wants to start a new career and qualify herself for a management position.
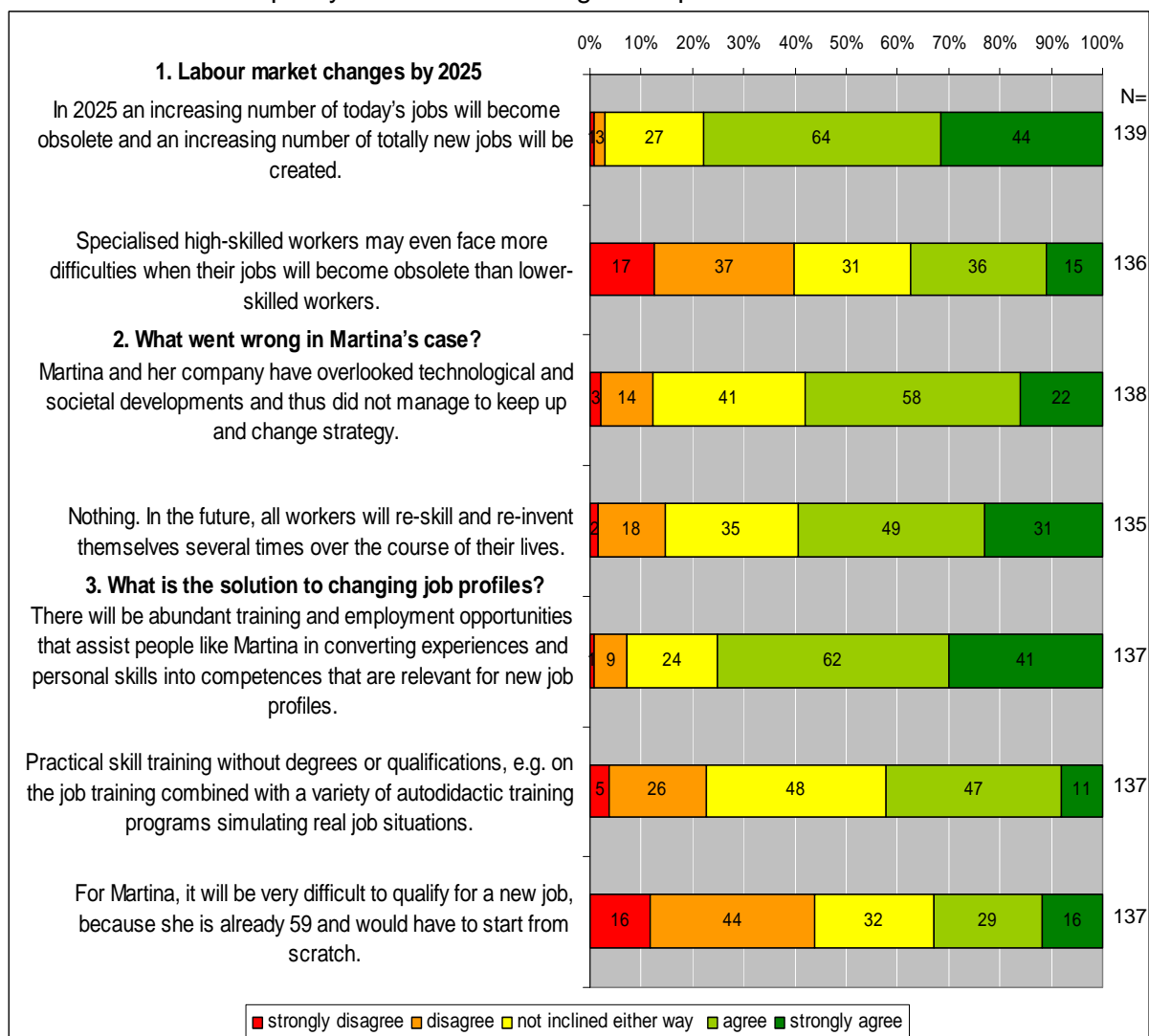
Figure 19: Results of online consultation (part II) on the persona of Martina (in absolute numbers)

120

Comments

- Experience will still count.

- Martina is a European citizen, for me.

- She will still have a lot to offer, by adapting rather than 'completely new'.

- Again, I could do without belabouring the gender point and I don't find the scenario terribly believable - if she was a computer engineer in all likelihood she would have kept abreast of technological change. At 59 it is most likely that she would have some management responsibility anyway; to avoid management responsibility she would have to be determined to avoid it or not be very good at it and so changing course would be unlikely.

- Just because training and employment opportunities will be offered doesn't mean that individuals will want to change. There may be a need to reavaluate the job to Martina's skills rather than retrain her to a new job.

- Last option has two contradictory parts - her age, and the need to start from scratch. At 59 her age may be against her, but she is building on many decades of experiences.

- Professionals are presented as atomised individuals. The fact is that they are members of professional communities, learning communities, and they should grow in importance in the future for supporting continuing professional development.

- Need to reconsider age of retirement and nature of retirement. Can we afford to lose a lifetime's expertise as we do now?

- For most of these questions it is possible to answer yes and no. There are so many different regional, sectoral, personal and employment situations that all one can do is try and feel for the general trends.

- I think the key is exactly in that sentence: "constantly adapting one's professional profile to changing job needs".

- There are some people who will never be ready to re-skill or re-invent themselves.

- Both examples are very relevant because they are quite atypical. A computer engineer unable to adapt will lose her job not when she is 59 but already at 35, at most 36 (consider Moore's Law).

- Better to avoid problem by constantly adapting, but when? Who is paying? Martina' kids missing her free time? For sure not her company, as it is cheaper to exploit her and then hire a "new" younger one.

- The difficulties with her age will depend on the particular country and the demographics of the population. Some countries will want to re-employ more older people due to a high proportion of older people.

- People must go inside of them and identify what they really want to do in the job and in that way they can install a vision of what they want to realise inside of the enterprise.

- More than the simple slogan of "life long learning" what sounds more accurately, necessary and relevant could be to design strategies to embed the idea of "continues learning" from the beginning of (formal) education. Also the incentives for that would be more than relevant.

- Again, this is too generalised. I think the potential for diverse and customised solutions is great. Of course that means that individuals will have to take a measure of responsibility for their own development. However, the principles of justice and compassion are extremely important in this debate. I see human beings as mines rich with potential jewels to be uncovered and polished. However, for that potential to be explored we need an environment that will foster stability and risk taking, muster courage to face unexpected challenges, develop non-adversarial decision-making processes and have the confidence to succeed. The days of one size fits all (or most) type of educational solutions have long since come and gone.

- The two options under question 2 seem to be the same, in reverse with the difference that re-skilling and re-invention could be seen as a joint activity rather than one delegated entirely to the individual. The 'abundant training and employment opportunities' is perhaps somewhat ambitious. Perhaps an alternative would be to consider the possibility of entirely different training and employment opportunities.

- I think that she has achieved an enormous potential in competence. She has worked in an area where problem solving and related skills are constantly employed, so she should have all that it takes to adapt and change her knowledge to meet the management position needs. So to speak a perfect "student" for adult education and training i.e. getting a degree in managing and leadership.

- What languages does Martina know to have for mobility to other countries for working?

- The concept of "today's jobs" is a problematic one. It is based on yesterday's industrial age statistical categories.

- The need to adapt one's professional profile is something I feel will be essential. However, given the current scale of deficits around the euro zone and the commitments made to the Greece bailout/euro support package, it's hard to imagine there being any resources for training and employment.

- Management is not about technical qualifications. If Martina has become 59 without realising her specialisation was coming to an end, she does not look like a good candidate for management.

- Starting from scratch is not a good idea at 59 - or earlier. People should build their careers on their own strong points.

- Point 2. It is both the company and the workers themselves who are responsible for updating of qualifications.

- Martina should have the transversal skills necessary to adapt her evident expertise to new situations. It will not be a question of starting from scratch, but rather of applying oneself to a new domain.

- It will not be very difficult because people will grow much older than hitherto thought possible while still enjoying the best of health. And high-skilled engineers will work longer than lower-skilled workers, because they started their career later and are less wearied at age of 59. Martina started her career at the age 28 - interrupted it for three years of maternity - therefore she has still a quarter of working period left.

3. Aspects of Lifelong Learning: Up-skilling

Slavi has just been promoted from senior scientist to manager of the nanobot division of a biotech company. He wants this promotion, but he realises that his management and leadership skills need improvement. He would like to address his training needs without any of his colleagues or superiors noticing it.

Slavi

1. Career paths in 2025

In the future, seniority and merit will remain the main criteria for promotion, rather than competences and qualifications. — 26 | 59 | 30 | 13 | 4 — N= 132

In 2025, Slavi will only be offered the job if he passes a range of tests assessing his management and leadership skills. — 8 | 33 | 44 | 38 | 9 — N= 132

2. Hierarchies and working styles

Career changes, re-skilling and longer work-life will flatten the hierarchical differences between juniors and seniors. — 4 | 19 | 35 | 56 | 20 — N= 134

Since older as well as younger people have their specific competences and knowledge, an open exchange between both will become important. — 0 5 | 12 | 61 | 53 — N= 131

3. Training strategies for Slavi

Slavi should not worry. Once in charge, he will be able to develop his own leadership style. — 24 | 45 | 39 | 20 | 4 — N= 132

A range of sophisticated learning tools and programs will make it easy for Slavi to discretely and anonymously train his skills so that he can effectively prepare himself for the new position. — 3 | 24 | 35 | 54 | 15 — N= 131

Slavi cannot and should not hide his inexperience. Rather he should involve his whole team in a collaborative training exercise which identifies the optimal interaction mode, based on each individual's strengths. — 3 | 12 | 25 | 53 | 40 — N= 133

Legend: ■ strongly disagree ■ disagree □ not inclined either way ■ agree ■ strongly agree

Figure 20: Results of online consultation (part II) on the persona of Slavi (in %, 131-134 responses)

Comments

- Slavi's key training strategies is likely to primarily focus within a distributed online community, which may involve members of his team but will certainly involve people in similar roles across businesses/industries. Anonymity will not be an option in terms of ongoing leadership development.

- Slavi is a European citizen, for me. He has in his pass as scientist an important prize achievement.

- The assumption here is based upon a large company setting. We have seen that they offer fewer jobs. Slavi may actually use his skills in a smaller company, start a business where he offers his skills to several companies etc.

- You don't learn on your own. Competencies don't reside in one person, but in a collective living organism. Being competent is also identifying others' as well as one's own competencies (and gaps).

- I hope this utopia will come true!

- I'm afraid certification programmes will still be needed in 2025. The difference is the way workers will manage to get ready for the certification.

- I hope seniority will not be a criterion for promotion!!! Competences more than age!!! YOUTH RULES!

- The last two statements under the last point, 3, provide two different solutions, both auspicable but utopian.

- I think the assessment (particularly this section) leads to a mistaken dilemma: continued lifelong learning and particularly the re-skilling approach won't change the high competitiveness of the world of work. In other words, even if Slavi finds a way to up-skill himself that has nothing do with the difficulty to reach a (better) job or position. Because, I think, the competition to find a good work position is a parallel problem that goes in a different track than up-skilling.

- Q1. Again, the focus seems to be on the current learning model with its validation route of assessment through testing - the ways in which learning might be validated has to change! Q2 - again mentoring and coaching has been omitted.

- The answer to the last question is depending of the organisation and its structure. In some cases the open approach could be better but then again in some other cases it might not be the cleverest thing to reveal.

- "Seniority and merit"? Merit is about track record and accumulated achievements, i.e., evidence about competences. I don't see how you can give merit and competence as alternatives. Is this a translation error?

- There is nothing particularly future about Slavi's dilemma: people aware they lack management skills have tried to remedy this discreetly for as long as there have been offices.

- Management tests are increasingly used, but more often than not they cater still to traditional thinking (i.e. GM) Flat - innovative - diverse - multilingual management styles tests need to be developed.

- If you don't have access to knowledge you will never be able to prepare yourself for a new position.

- All solutions are partly true. One has to learn management through practical application, but one can read about it and become sensitive to good practice.

- Whereas I agree that Slavi should not be embarrassed about his experience, to be open about this to his colleagues would effectively undermine his position as a leader thereby loosing respect.

Comments on Online Consultation Part II

- Certification of both knowledge and skills in real situations. use of interactive tools to 'record' this lifelong learning process for exchange of experience, best practices, evaluation and assessment (formative and summative).
- 2025 is not very far into the future (only 15 years from now). Compare changes from 1995 to 2010: to what extent has working life changed in this period? I would argue that fundamentally it has not changed, though of course certain trends can be identified.
- If expertise and position status are still the measures of success in life in 2025 then we will all be drowning. A greater understanding of systems thinking and need for everyone's contribution to survival will mean that a wider variety of jobs will be understood as being important. Those who are good at surviving the inherent values changes will be valued and have status.
- I missed the role of coaching in this part of the survey as an important addition to formal training and tuition. I expect that in 2025 coaching will be everyday life experience for the workforce, supporting a continuous attention to self-development, learning new competences etc.
- I appreciated being able to add comments but find that the level of generalisation in this type of survey makes it very difficult to give a reply that one "believes in"!! I'd appreciate surveys that were more focused on fields of work or employment. Just to repeat I don't think that progress is ever linear (we've lots of research on the 19thC about that!!) and this is a complex situation and period that makes it hard to give simple replies. Am I being too complicated???
- Next week I will not be available. as I am on vacation.
- This is a nice survey. I would appreciate seeing the results... and, I invite you to share them also with my audience at Education Futures http://www.educationfutures.com
- The questions that you pose seem to have a bias towards a specific future.
- Would be this consultation managed as a Delphi survey?
- Good success to your project
  Please send me the results....
- Yes, one of today's most urgent needs is to develop non-adversarial meeting and consultative processes for the sake of fostering better understanding of issues. In this context the goal and the way towards achieving may well be one and the same process that improves and becomes more effective with experience and practice.
- Congrats! Very smart survey technique. All the wishes of an excellent work.
- When are these results ready? Where can I review them?
- How about the 0-18 generation of today in this tomorrow-oriented study?
- This was fun.
- Countries will change differently on the base of common values. Countries in which the rate of corruption infected the civil society on large scale will never be adequate.
- To obtain Knowledge and advanced education, skills and experience - there are to be different ways and resources in 2025 if we compare Germany, the Netherlands (West Europe) with Latvia, Lithuania. Gaps and problems of mutual understanding are increasing.
- Excellent survey. Thought provoking.

D. Survey III: Tackling Challenges

Themes: (1) Early School Leaving; (2) Aligning E&T with labour market needs; (3) Low qualifications
Personas: (1) Bruno, (2) Joshua, (3) Ingrid

Bruno

2. Early School Leaving
Bruno is 14 years old and really not interested in school anymore. He spends his days hanging around with friends and playing computer games instead of going to school.

	strongly disagree	disagree	not inclined either way	agree	strongly agree	N=
In 2025, early school leaving will be a greater problem.	7	24	34	21	12	98
...because:						
...young people will learn informally, like in social networks, and will thus be even less interested in formal E&T.	11	20	25	27	13	96
...an increasing number of pupils will not be able to cope with the rising expectations.	11	21	25	30	5	92
...social divides will increase, unemployment will spread, more and more young people will be left behind by society.	9	26	20	31	9	95
In 2025, early school leaving will be less of a problem	10	23	27	24	4	88
...because:						
...there will be a variety of ways in which degrees can be obtained and students with different needs and interests will more easily find a learning option that suits them.	5	9	16	45	23	98
...informal learning will have become recognised and practical experiences are more important than degrees and qualifications.	9	18	27	28	13	95
...schools will have disappeared altogether and be replaced by learning opportunities that are integrated in life and society.	43	27	13	11	3	97
Future strategies to fight early school leaving include:						
Personalising school education to better meet individual needs and interests.	2	9	11	41	36	99
3D virtual worlds and computer games to encourage and motivate students.	7	16	34	34	7	98
Opening up educational institution to society; embedding learning in the social life of a community; integrated work experiences.	2	5	12	38	43	100

Figure 21: Results of online consultation (part III) on the persona of Bruno (in absolute numbers)

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Comments

- I would not talk about "fighting"; it should not be fighting against, but rather developing further or something like that.

- I think that the outcome, early school leaving is the outcome of a complex system, in which network effects lead to emergent outcomes, and not open to these linear kinds of either or options.

- It is difficult to choose one side of the alternative between increase/reduction of the impact of school drop-out. If society stays as rigid as it is, and if educational institutions don't change radically, then they will contribute to make the current problem worse. Schools, in France, already contribute to the increase in social inequality. One could even say that the increase in (chosen) school leaving could be an alternative to a school reform that might never happen. May be 'school drop-out' will be displayed as a 'badge of honour', and people going through 'normal' schooling will be considered as failures and socially inept -- if one considers that creating a business is a sign of success, as a majority of entrepreneurs are school drop-outs, then one could say that the school succeeds when it fails (to provide informal education...)!

- The key challenge has already been identified by OECD and others - the 2nd digital divide. The question should focus on how education is valued by different groups in society. Those who already value the socialisation aspects of school (as well as the direct learning benefits) will continue to thrive, but other groups are in danger of greater marginalisation (digital and social).

- School itself should be totally different in 2025. Thus, some answers seem divergent, depending strongly on what we imagine school could-should-would be.

- Early school leaving is a problem linked to tre

- While I strongly wish there will be changes that reflect the 2 trend above of a variety of ways degrees can be obtained and the recognition of informal learning, the entrenched interests (unions, politics) are such that I fear that it will not be achieved in any great scale so quickly.

- The availability of different ways of reaching qualifications is likely to vary considerably among countries. Given how long it has taken to get to a point where even quite basic RPL is beginning to be implemented but not everywhere, I'm sceptical about the amount of progress in the next 15 years. Again with practical experience that will depend a lot on systems and societal attitudes and practices. I hope that there will be a higher level of personalisation of education that is really human-centred! I'm not totally hopeful. Here again I think that differentiation will continue to be very important though this will partly depend on how accountability regimes for teachers and system evaluation as well as assessment approaches evolve.

- Our ability to adapt formal education to new trends and concerns will be decisive to preserve the relevance of Schools and their role in a wider learning system involving other contexts and organisations.

- Children will still need to learn how to learn, and the 'digital' dimension will certainly help if used in the right way - but school will still be required to set the fundamentals form an academic perspective. Hopefully we will be attracting the best people into the profession and ensure that those who are not up to the job are taken out of the profession.
  Some people are just not 'academic' and alternatives are important to ensure people leave school in a confident frame of mind that they can take into the workplace. I still think people shouldn't be taken out of the 'academic rigour' process completely.
  The danger is that when you ask people 'what do you want?' they don't know, and come back with things that aren't necessarily good for them.

- You should offer more future strategies to fight early school leaving in your questionnaire. If you would offer societal integrated augmented reality and technology-enhanced learning I had given 5 points. If you offer 3D virtual worlds and computer games I can only think on escapism and learning far from reality. To offer games instead of stimulating learning experiences is the wrong way. It is similar with personalising school education. I can only give two points, because I think as well on learning contents. If you would offer personalised learning paths also for basic knowledge, I would give five points.

1. Transition from Higher Education to the Workplace

Joshua is 23 and has just graduated from college, specialising in hotel management. In 2025, however, the vast majority of hotel guests are from Asian countries. Since Joshua does not speak any Asian language and has no knowledge of Asian culture and etiquette, he is unable to find a job.

1. Responsiveness of E&T to labour market needs

By 2025, global changes, like the dominance of Asia, will have been recognised by education and training, so that something like that cannot happen: Joshua will have learned not only Asian etiquette, but also some Chinese, Japanese and Indian in the cours — 5 | 17 | 32 | 34 | 3 — N= 91

Employers know that recent graduates usually do not possess job-relevant knowledge. By 2025 companies train their own staff and select graduates on the basis of their basic skills – reasoning, judgement and communication skills – tested in an entrance ex — 2 | 10 | 31 | 39 | 8 — 90

2. To better prepare learners for future job requirements:

If languages are not his strength, Joshua can simply apply for another job. In 2025 subject specific knowledge will not be relevant anymore for recruitment. — 22 | 35 | 21 | 10 | 2 — 90

Education and training institutions have to work closer together with industry and align learning objectives. — 1 | 6 | 10 | 40 | 33 — 90

In the Future, it will impossible to anticipate all changes to jobs and markets. Therefore, it is normal that people will need to supplement their official qualifications (which cannot and do not reflect labour market needs) with extra on the job training — 0 | 2 | 10 | 48 | 30 — 90

More attention should be paid to general competences and transversal skills: Job requirements will change so frequently that there is no point in obtaining special skills that are quickly outdated. — 3 | 12 | 15 | 38 | 22 — 90

3. Strategies for Joshua

Joshua should try to start in a hotel below his qualifications to collect some work experience and in parallel learn some Chinese or Indian. — 2 | 16 | 19 | 41 | 12 — 90

Joshua should volunteer to participate in a development aid program in India and gain some practical insights on Indian language and culture. — 2 | 16 | 29 | 31 | 12 — 90

Joshua should train his occupational skills using virtual reality trips to Asia and online games which simulate cultural conflicts. — 5 | 15 | 30 | 33 | 7 — 90

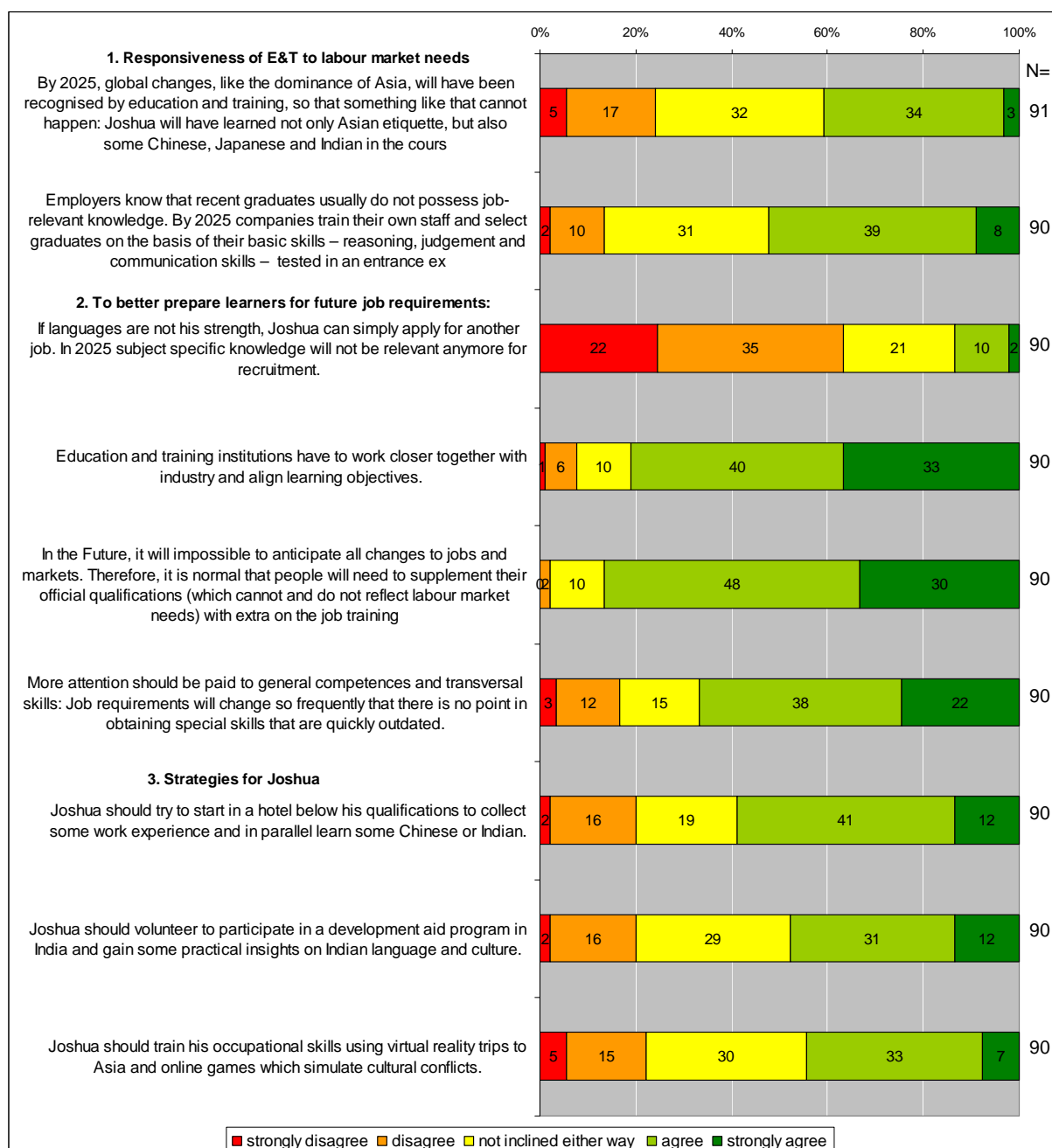Legend: ■ strongly disagree ■ disagree □ not inclined either way ■ agree ■ strongly agree

Figure 22: Results of online consultation (part III) on the persona of Joshua (in absolute numbers)

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Comments

- We are a group in Algiers and we work about the future of the higher education in 2030 in Algiers with the point of vision of the employers association we finish this work in June and I find many same questions about the future of higher education.

- In this case EU will prepare staffs for Asia; EU should think what their countries need!

- Globalization proceeds as a counter trend to cultural differences. I am not sure if in 2025 need for competency in culture-specific knowledge is so decisive. People tend to be more cosmopolitan by nature and at least there will be a more uniform code for behaviour in international contexts.

- Joshua's strategy would depend on many personal factors and is difficult to judge without more information.

- We are moving to service economy dominance from industrial economy dominance, but no one still knows really how to produce and consume services - as previously manufactured goods - what is the concept of service as the dominant sector and innovational part of the economy of the hyper agricultural and hyper industrial societies and global markets.

- "Education and training institutions have to work closer together with industry and align learning objectives." Why not the opposite statement where "industry will have to align itself to the values learned in education (green, sustainability, trust, decency, honesty, caring, etc.)"? But for me to be at ease with this statement, that I find perfectly valid, one should radically change educational institutions that are for most of them the centre of conservative ideas -- teachers, as a group, is probably the most conservative one in our society.

- To better prepare learners for future job requirements education should provide flexible and adaptive skills of expertise.

- As ever I find it hard to make judgements and want to answer "yes, but..."

- The challenge will be to adapt to different contexts and job mobility requirements keeping active in learning routines according to time and resources at hand

- Learning in a classical sense is very different from learning for purely market-driven reasons. The former helps you learn how to learn and means that you can apply that skill to on-the-job training. Market-facing learning/training changes with the whims of however the economy is progressing, and this could change year on year. If you are narrowing people's learning into one area you are missing out on the possibility that they may go onto uncover new and exciting innovations. Maybe China's highly technical approach to learning is a good example of this.

- Strategies for the hotels which need hotel management is to offer their future employees possibilities to learn Asian culture and etiquette by participating in volunteer programmes in Asia and to pay the participants a sufficient fee and may be an additional credit. Because they know that employees and their family need the money to survive during that time. Asian languages are less important - Joshua will learn them on the job or in courses paid by himself or paid by his employer.

3. Low-skilled workers

After secondary school, Ingrid started to travel the world, financing her life by working as a bike courier. After an accident, at the age of 32, she is left with a limp leg and has to find some other form of income.

1. Labour market developments

By 2025, there will be less employment opportunities for workers with no or low qualifications. Nearly all jobs will require a higher level of skills than today. — 3 | 14 | 19 | 36 | 18 — N= 90

In 2025, there will still be jobs that do not require professional qualifications. However, these will (mostly) involve physical work, which Ingrid might not be able to do. — 3 | 13 | 26 | 36 | 10 — 88

2. Recognition of informal learning and professional experience in 2025

By 2025, Ingrid's informal learning experiences – gained through travelling and working - will have been recognised as a valuable asset for a new job, maybe in a travel agency. — 5 | 7 | 27 | 36 | 13 — 88

In 2025 Ingrid will be able to obtain official recognition of her skills by taking a standardised test certifying her level of experience. She can then build onto this with further targeted training. — 12 | 23 | 47 | 6 — 89

In 2025, all jobs will require some kind of entrance exam assessing candidate's occupational skills. For many jobs, prior qualifications will be irrelevant – only the exam will matter. — 12 | 37 | 25 | 14 — 89

3. Strategies for Ingrid

Ingrid should get a drivers license and start as a taxi driver – a job similar to the one she did and possible with her physical restriction. — 6 | 25 | 38 | 14 | 4 — 87

Ingrid should aspire to upgrade her qualifications to have more employment options, also in view of the future. She could, for example, start a university course in a subject of her choice, like languages or cultural studies – online and part-time while d — 3 | 10 | 53 | 20 — 87

Ingrid has postponed decision on her career long enough. She should now make up her mind about what she really wants to be, take targeted action to qualify for this job and then build up a professional career around it. — 7 | 18 | 22 | 27 | 14 — 88

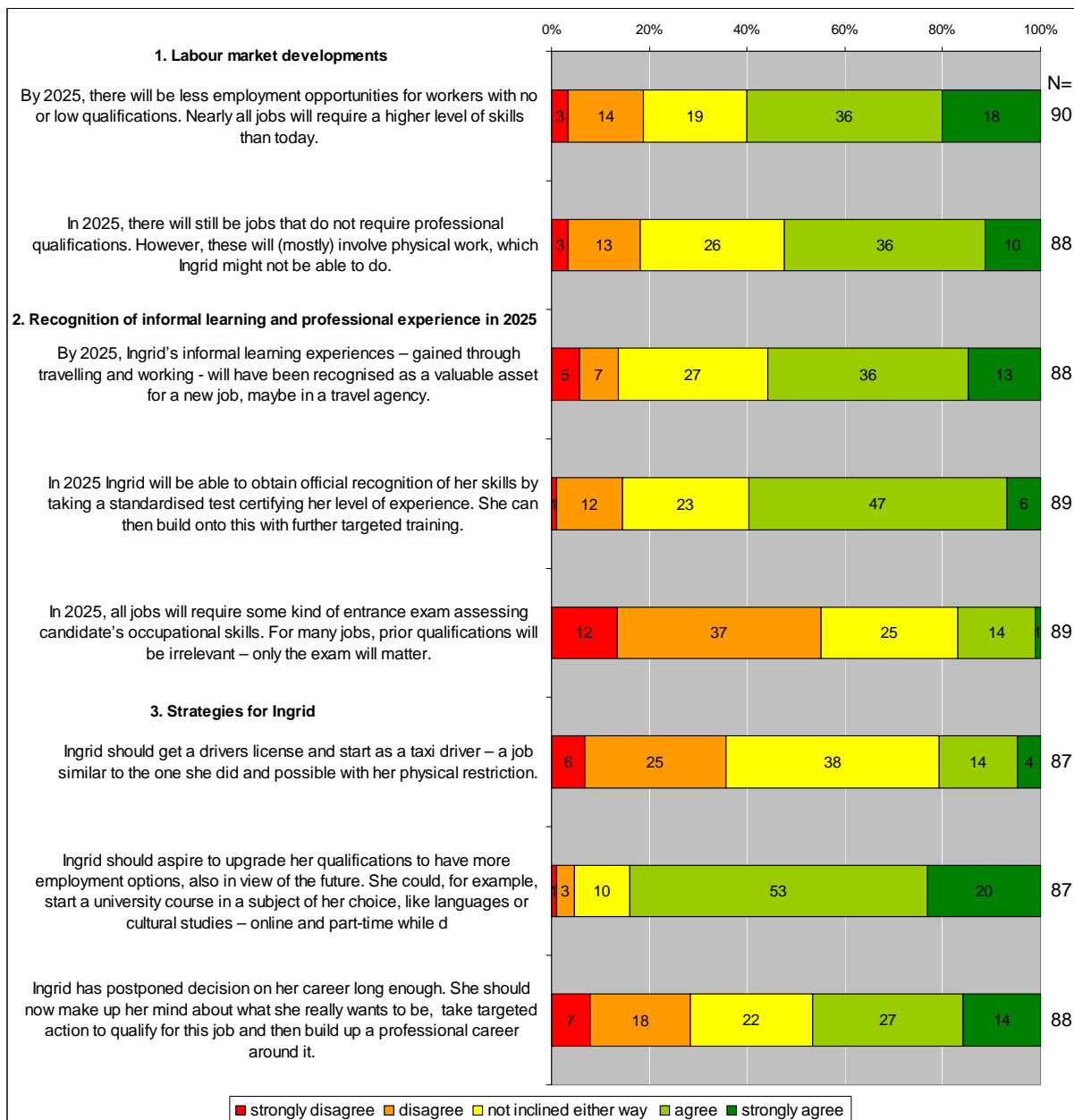Legend: ■ strongly disagree ■ disagree ■ not inclined either way ■ agree ■ strongly agree

Figure 23: Results of online consultation (part III) on the persona of Ingrid (in absolute numbers)

Comments

- A Simplex Project for zero bureaucracy is underway in European Academic Systems since 2020.

- In the future, low-skilled persons are accepted and recognised. Ever smaller part of people will earn the money that is needed for living of all the people. The society lets Ingrid search for own competencies in her own way. It is seen that in the course of time she finally finds her strengths, which only were hidden for a longer time or combination of her skills was so complicated that it only took more time for her to find her place, If not, the social security takes care and guarantees a valuable life for her.

- Ingrid should build the experiences and skills she acquired from her travelling and not to start from ground zero.

- Why do you believe that only exams can provide evidence of competencies? There are many other ways to recognise learning, like ePortfolios, informal recognition by a community of peers, etc.

- In 2025 few people would be interested in my skills 20 years ago. Thus, only contextual know-how would matter.

- I think that although informal learning is rhetorically backed up by politicians I also sense a much stronger urge to control and micro-manage education to ensure 'value-for-money' - I sincerely hope this strategy will disappear in favour of a high-trust strategy where educational institutions can work more freely on basis of a very broadly defined curriculum.

- Poor Ingrid, her options are quite classic.

- These options will depend on personal ambition and drive. Chance will also bear an important part.

- Speaking from experience it's hard to convert the soft skills that you amass through travelling into a working role. You do need to work at how this helps in the role you have - its definitely true of languages, and it also makes you better at meeting people and striking up friendships and acquaintances, crucial things for actually getting a job and being part of the team. It's just hard on a CV to really get that across - I wonder how the methods by which we will find people will move away from the classic CV approach where you get to see people in action.

- I don't believe in "a standardised test certifying her level of experience" - but I give 5 points because I believe that there will be a lost of task- and topic oriented testing methods. Some standardised and some more qualitative oriented and fluent. I don't believe on the entrance exam either. I regret that you don't offer more flexible forms of verifying other than examining informal learning experiences.

Comments on Online Consultation Part III

- We need to focus on the mechanisms by which we will get educational and governmental groups to recognise the necessity for these changes and strategies.

- Very nice approach with the characters.

- Service economy concept and the concept of services in a hyper agricultural and hyper industrial societies and global markets is not too well understood - and they are just emerging.

- Very interesting work. Wishing you all the best.
  I will greatly appreciate it, if it is possible to share the findings of the study.
  Thank you.

- The responses were fixed; you haven't thought about the completely unpredictable that will happen.

- In 2025, lifelong learning will be seen as natural and inevitable.

- I miss questions on strategies that we should begin to implement now to prepare for the problems and issues that we expect for the future.

- The education of the future will be related to the needs that each society is developing at every step, with gradual changes, not revolutionary ones. Travelling around the world usually opens minds and personal skills (situational judgement) are in many jobs currently available as important as knowledge skills. In my opinion, Ingrid would have more chances of getting a job (as a sales agent, for instance) than a non-educated person who has always remain in the same place.

- I can see the value of the characters much more having done this exercise - it would be interesting to see how we can extrapolate them out further to help decide what decisions they should take, showing consequences. Happy to discuss.

E. Survey IV: The Future of School Education in Europe

Themes: (1) The future role of teachers (Frank); (2) Personalisation (Emma); (3) Equity & Inclusion (Chanta)

1. Teachers

Frank is 75 years old and has just retired from being a high school teacher. He believes in the importance of pedagogy and would like to help younger teachers by passing on his knowledge.
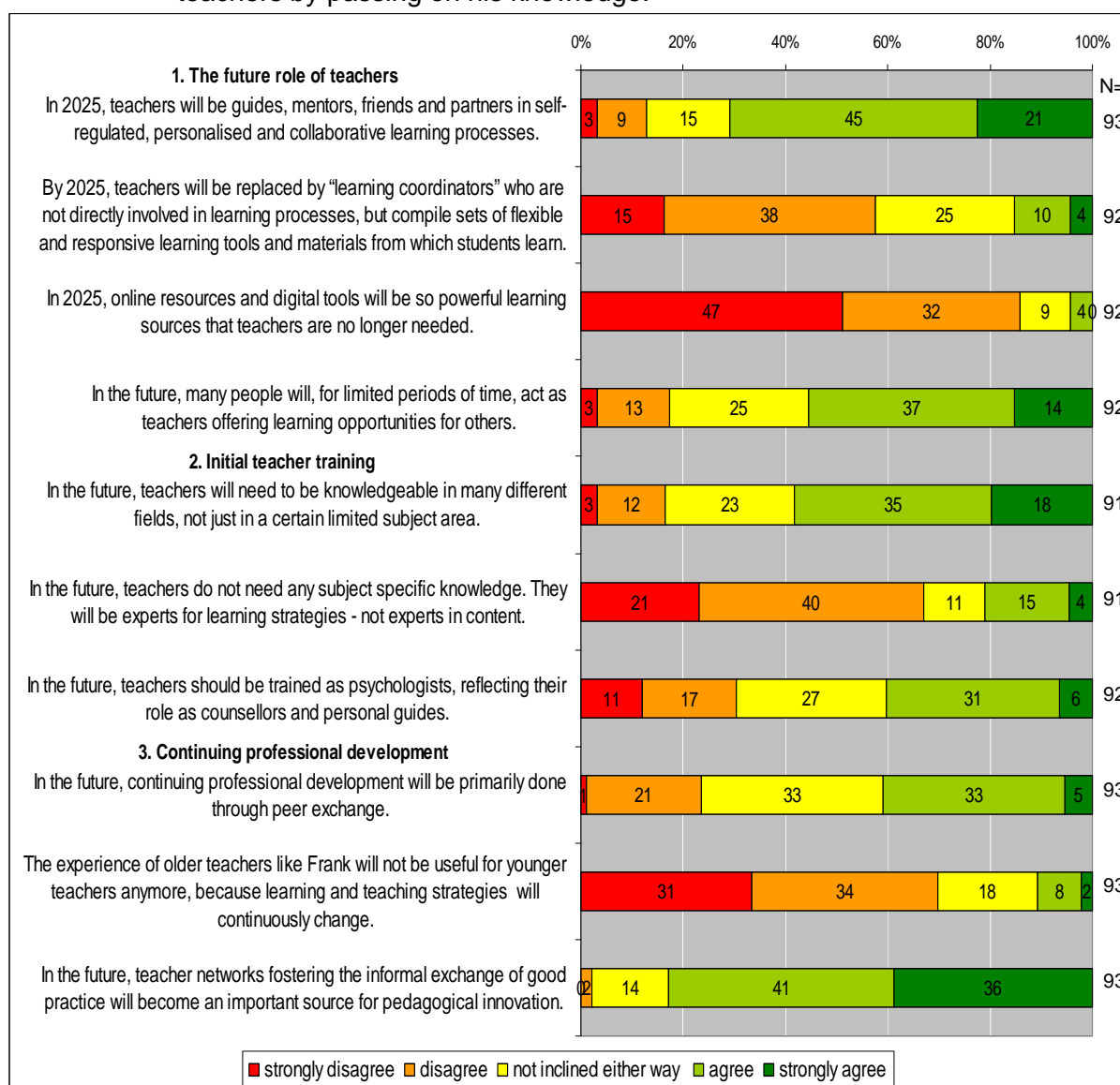

Figure 24: Results of online consultation (part IV) on the persona of Frank (in absolute numbers)

Comments

- Perhaps you could use a two-dimensional probability-desirability space. I would like to see outcomes like the scenario in the first question, and the idealist in me wishes to vote 5, but the pragmatist in me wishes to vote one, because I think most people in this sector are control-freaks and this is not likely to change.

- The emphasis should be on learners rather than teachers. We could so easily create so many more appropriate learning environments relevant to different learner needs. Ideally, teachers will become learning facilitators, and their productivity and value will increase significantly.

- I don't believe that the changes will REPLACE traditional teaching, but rather complement and extend the roles...

- I really think the bias of this survey is to suggest/imply that teachers will be a thing of the past. What I think will happen is that customized learning resources, activities and support will be the norm, but that subject specialists will still be required to manage the day to day learning environment/s be they F2F or online. And the nature of the online experience will likely reflect an international flavour, with learners interacting with learners from other countries as if they were in a physical space.

- 1. How is the gender related in the teacher's role?
  2. Prof. Howard Garnder teaches us about multiple intelligences and five minds for the future > how are they linked to the setting of this study?

- The question about 'teacher knowledge' makes an assumption about subject/not subject knowledge that doesn't capture the complexity of teacher knowledge and subject domains.

- As with all of the surveys in this series, I find that this one ignores social-economic class distinctions. I might be able to answer these questions in the affirmative for upper income groups, but would have to answer then negatively for the lower income groups. This leaves me with answers somewhere in the middle of the spectrum, which I am sure is not very helpful.

- I strongly believe that nowadays we are already witnessing the emergence of learning professionals and special learning leaders.

- In the future, any/any pedagogical/intellectual/educational practice or resources will be eligible for consideration to participate in learning design, preparation, production and provision. Of the many, some will earn the acceptance and reputation to lead, and they will determine the how and the what for people wanting academic credentials and keeping them relevant.

- Because of lifelong learning, the focus will be on heutagogy (and maybe metalearning). Hence, teachers will tend to become catalysts of the learning process.
  Focus will move from static general knowledge to dynamic personalised knowledge. The quantity of knowledge must be replaced by the quality of skill.

- Continuing professional development has always been done through peer exchange (except maybe for "solitary" professions - I cannot think of one example now)

- Excellent work - very valuable (looking for the outcomes).

- Frank and other illustrations are reader-friendly. They're good. Statements are clear.

- It would be interesting to know how a person like Frank is already today not able to transmit his own knowledge.

- The teacher networks are already powerful in many countries and will continue to be such. Teachers will need not to become psychologists but to have good knowledge of applicable learning psychology as is the case in many countries already. Subject knowledge is needed also in the future to give models to students how professionals think and talk. Professionals of other fields will even in the future be a scarce resource in schools and in wider learning networks in which students may engage.

- As with the previous surveys, there could be different answers depending on the type and level of learning, the type of institution, country, etc.

- My opinions were sometimes less strong than they could have been because the answer very much depends on whether you are talking about mandatory education to youngsters or post-initial education for adults.

- Responses assume that Frank's views on pedagogy are evidence based and continue to reflect developing knowledge from education research.

- I can only give two points instead of fore points for "In the future, teachers do not need any subject specific knowledge. They will be experts for learning strategies - not experts in content." I can only

give two points because I know by experience that it is indispensable to get something like an expert in several fields to become an expert in learning strategies and in organizing learning processes.

- It would be helpful if you better identified who the learners of the future will be. Are we talking about young children? Teens? Adult education?
- In the future, teachers do not need any subject specific knowledge. They will be experts for learning strategies - not experts in content.' This is not answerable if like me you think they will need subject knowledge AND expertise in learning strategies. The two are not mutually exclusive!

2. Personalisation

Emma is 16 and a good student who generally enjoys learning. However, school bores her. There are so many things she wants to know, to say and to do and no room to express herself. She can't wait to get to university where she hopes to be finally treated like an adult.

Emma

1. The school of the future

By 2025, schools will have implemented personalised learning plans that take into account individual needs, interests and preferences. — 0 5 | 15 | 47 | 25 — N= 92

Technology will allow schools and educators to create tailor-made learning experiences which increase learning outcomes. — 0 4 | 10 | 47 | 30 — 91

By 2025, standardised degrees and testing procedures will have disappeared. — 21 | 35 | 22 | 10 | 3 — 91

In the future, students will not be enrolled at a single school, but combine courses and resources from different educational institutions and decide themselves which local and virtual learning communities to join. — 7 | 13 | 26 | 31 | 14 — 91

2. To better address future learning needs...

Education and training institutions have to implement better monitoring and assessment mechanisms which detect individual learning needs. — 2 1 | 8 | 38 | 43 — 92

Curricula need to take into account students' interests. — 2 3 | 12 | 41 | 34 — 92

Learning needs to become competence based, rather than knowledge based. — 3 8 | 20 | 32 | 28 — 91

Schools have to increase their efforts to open up to society and integrate real life experiences into their teaching practices. — 1 2 | 6 | 35 | 48 — 92

Schools need to cooperate closer with university and enterprises to help students in their career choice. — 0 2 | 13 | 36 | 41 — 92

The advantages of technologies need to be better exploited for personalising school education. — 0 7 | 34 | 51 — 92

3. Future strategies for Emma

A range of technological tools will help Emma to design her own (accredited) learning trajectory, combining face-to-face tuition at school with online university courses and online learning communities. — 1 5 | 16 | 42 | 28 — 92

Emma should be encouraged to engage in extra-curricular activities, e.g. in workshops or (online) communities, where she can learn what she wants and how she wants to learn it, in collaboration with other learners. — 0 9 | 42 | 40 — 92

Emma should be encouraged to participate in a volunteering activity where she learns to help other people and is encouraged to build up knowledge in a practical field. — 0 7 | 18 | 30 | 37 — 92

Legend: ■ strongly disagree ■ disagree ☐ not inclined either way ■ agree ■ strongly agree

Figure 25: Results of online consultation (part IV) on the persona of Emma (in absolute numbers)

Comments

- "Curricula" cannot be adjusted for students' interests. They are outdated, inflexible, linear tools that completely misunderstand/misrepresent how the human mind learns. Curricula could so easily be replaced by knowledge and skills "granules" that can be accessed by a potential learner as and when they wish.

- 1. The social groups face-to-face are important to teenagers. In the Finnish gymnasium system the school model does not include "class" any longer and the pupils are only grouped ad hoc according to their choices of courses/subjects.
  2. The loss of a "class" and "class mates" as a social group has an effect on the maturing and learning situation of a teenager. She/he can be "lost" in the competitive school system as there is no longer a group s/he calls "we" or "my class".

- Again, I suggest that there is an underlying assumption about competence vs. subject knowledge which is too simplistic.

- Rephrasing the sentence: Schools need to cooperate closer with university and enterprises to help students in their career choice by university and enterprises need to......

- Education is not to fill the mind, but open it.

- The teacher's present object of work (teaching) is neither present nor object, since it aims at a future, quite far away, process (learning). Why should the teacher focus on solving problems, when the learner should focus on managing situations?

- Curricula are political documents. It would be difficult to take full into account students' needs.

- Most of trends projected here are not so much hampered by immature technologies but rather restricted by institutional rules, procedures and traditions.

- Competences are a folly as we consider them as something that can supplement grades. Of course competence should be the goal, just as knowledge, but how do you measure? In my opinion by real-life praxis and personal goals.

- Maybe learning needs to be both competence and knowledge (and skills) based. See article by Young and Muller in European Journal of Education, March 2010.
  There is a certain margin between what one would like to see in learning and what one fears may not move that quickly. The old issue that "education is a slow learner".

- To the question "By 2025, standardised degrees and testing procedures will have disappeared." I don't hope so because they are very helpful for a lot of people to organize learning processes and to identify qualification levels. But I think that there will be several alternate possibilities for all the people for whom standardises degrees and testing procedures doesn't fit.
  To the question: "Schools need to cooperate closer with university and enterprises to help students in their career choice." With learning paths it is a little like with the freedom of science. If you optimize education on career and the need of enterprises you don't get high-skilled and high-qualified employees. Pupil and students lose fascination and enthusiasm and in particular their intrinsic motivation.

- Schools are an important stable environment for students to practice sociality. In this sense, whilst resources may be drawn from elsewhere, this stable environment is essential for the people skills that teens cannot learn outside of peer interaction. Schools also have an important mainstreaming/transformative function. That is, all students become students. Personalisation is useful, but it is the media, not the message, and students will need to be able to engage with non-personalised media outside of school. Also, curricula should inspire student interest, not respond to it. Also, knowledge has to be appreciated as important for competence to be valued.

3. Inclusion
Chanta is a 6 year old Cambodian girl whose family has just emigrated to France. She does not speak a word of French and feels completely lost.

Figure 26: Results of online consultation (part IV) on the persona of Chanta (in absolute numbers)

Comments

- I fear that assimilation will be the stronger drive than embrace of diversity. I am not sure that saying diversity will be there and that it can be positively accommodated (e.g. technologically) is enough to determine that the reaction would be affirmative.

- The human mind has evolved to develop language(s) in the first 3 years of life. If only "educators" would learn from research about learning, by now every infant would be given the opportunity to experience (and therefore develop) at least one of the global languages alongside their native language in their first 3 years.

- The cultural learning is face-to-face most efficient. The virtual learning platforms are only on the secondary level.
  The sisters and brothers of Chanta are important for her learning, too.

- It maybe possible that the importance of languages becomes more accurate as youngsters are building new contexts for communication.

- In 2025 proficiency - well above 'tourist' level - in many languages will have become the most important and valuable personal competence - in any field.

- Agent-oriented transcultural multimodal interfaces will become usual.

- If Chanta is six, likely her Khmer knowledge is not so culturally strong. Does it worth to learn French through Khmer?

- Person-to-person interaction is most important for Chanta to grow up to be a real bi-cultural person.

- Well, the world is so complex that we should not look only how to integrate migrant students into European context but help solve the more pertinent challenge of fighting for achieving EfA and MDG goals particularly in Africa, where it looks unlikely to achieve access to basic education for all by 2025. Tackling challenges successfully in Africa is the first priority. If successful there, pressures to tackle challenges of migration will be easier in Europe and less based on mitigating problems of population overflow.

- Cultural and intercultural awareness should become an important element in the curriculum but it is still one of the competences that rapidly gets axed when credits are cut. The key competences and especially learning to learn who you are and how you learn are still not seen as fundamental to young people's learning but still tend to be viewed as "extras". Even if multicultural classrooms are becoming the norm (and I would prefer to focus on the idea that every classroom is a place of diversity - inner and external diversities), it is not certain that formal education systems will have sufficiently integrated that into their approaches, except at a superficial level.

- Future strategies: 1. Digital games and virtual worlds are very risky in this situation, if they are not combined with real world and real time experiences. Chanta may get lost in the virtual worlds.
  2. All these mobile and real-time translation technologies geeks forget that language is always an expression of culture. It organizes our view of the world we live in and structures the acquisition and storage of knowledge. Thus translation may be very fine for organizing every day life but never well enough for a deeper understanding.

- If global mobility increases, I suspect home cultures may become more conservative and protective of national identities and more aggressively assimilatory. Moreover, I suspect that inclusion budgets will be some of the first to be cut in terms of technology as policy makers do not understand the different indices of expense. For example - current policy around successful schools leaving LAs and the student premium may have a huge negative impact on students with disabilities as provision ceases to be sustainable in house. In this sense I am concerned that the most disadvantaged students will remain disadvantaged, and this is compounded in the distribution of resource in technology/education policy.

- I feel Teachers in the UK already value students from different backgrounds.

Comments on Online Consultation Part IV

- Please kindly contact me when results are ready.

- Humans have evolved such that the infant's mind is an insatiable learning device, and infants love to learn. Yet we have developed a formal education system which turns learning into something most children tolerate (what option do they have?), and many hate. This system manages to misinform the rest of society that the majority of children who go through it (and are seen as failures, underperformers, non-academics, etc...) are the problem. The current system is the problem, in part because of its assumption that "learning to read then reading to learn" is fine for all. Instead of "improving" them, we are harming the minds of the majority of our children - and the relevant research makes it no longer a valid excuse to proclaim our ignorance.

- Excellent work. Congratulations.

- I have been very happy to participate in these surveys. Just asking these questions helps me think about what do today as a teacher. Even if the future turns out very differently than is implied by these questions, the fact that we have thought about these issues will help us meet that future more effectively.

- What would be attitude towards use of a term "foresightology"? Why?

- A scenario to 2025 means a great change within 15 years. Although I agreed that shall occur, I think shall be focus in some niches and shall not be the norm. We are talking mostly of a cultural change: those are most difficult to occur in a medium. Let's see the millennium goals! Technologies: yes. Institutional changes: maybe.

- When looking at the future, we first should try to look what happens know that we do not understand. For over 90 years, schools like Summerhill Suffolk, have been educating student without force, without grades, without curriculum, without classes and with seemingly good results, but as of yet, no structured well designed research has been done on this group. Today 40.000 children in the world go to such schools. It's like an entire city not suffering from disease, with no doctors bothering to investigate, why?
http://en.wikipedia.org/wiki/Democratic_education

- My comments always tend to be similar and that is to underline the diversities among systems and approaches, progress never being linear.

- As with all these statements, I'm not sure whether I'm being asked whether I believe that this is the way things SHOULD be, or whether I believe its the way the WILL be. I am answering according to what I believe SHOULD happen, even where sometimes I think it is unlikely to happen (because education always lags behind and resists change).

- As you see I mostly agree with the statements. I think they are desirable points of change.

- It would be lovely for some of these ideas to 'come true' but I think asking about virtual worlds in 15 years is naive. In 15 years our tech will have transformed, and so too will our students (will the next boom in technology be biological?). Why plan for an education using current technologies (social networks, online communities) that, in the future, may have been redundant for 10 years. Many of these techs etc could be implemented tomorrow - but there's no money to do it. In this sense, the future you describe is 'already here, it's just unevenly distributed'.

- Totally missing is the learning/strengthening of moral behaviour! Think about increase in bullying, violence at school and street, vandalism ... and economic elites without societal responsibility (Lehman Bro., BP, ...)

Abstract

This report synthesizes the findings of a series of four online consultations which were conducted as part of the study "The Future of Learning: New Ways to Learn New Skills for Future Jobs". The aim of this foresight activity was to develop visions and scenarios on the ways in which people acquire, retain and update the necessary competences for successful and prosperous lives in a fast changing world, with a view towards addressing emerging competence needs and ways to increase individual employment opportunities. The consultations each involved between 90 and 150 experts and took place from April to June 2010.

The findings of these consultations suggest that, while the existing physical and formal structures of education and training will remain intact, schools and universities will change significantly with respect to pedagogical strategies. Learning and teaching processes will be more flexible in addressing and implementing individual needs and preferences. As a consequence, teachers will become mentors and guides in self-regulated, personalised and collaborative learning processes. Schools as institutions will open up to society by integrating external learning resources and practical learning opportunities. Technology will assist learning institutions in facilitating both, personalisation and institutional flexibility.

Furthermore, experts believe that, in the future, all citizens will have to continuously update and develop their skills; assume responsibility for their qualifications and pro-actively develop their professional career. While attaining formal qualifications will remain key for grasping new employment opportunities, informally acquired skills will be better recognised and mechanisms will be put in place that will allow people to obtain formal recognition for their professional expertise, by upgrading their skills with adequate and targeted training.

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