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D 2.1.3: Learning Goals and Tools for Assessment

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ATS2020

Assessment of Transversal Skills 2020

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Outline:

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1. Rationale

Assessment became a hot topic during the last decade. One reason for this lies in the emphasis of evidence based policy making (e.g. Sanderson, 2002). This led to several large scale assessment studies for different levels, e.g. the PISA (e.g. OECD, 2007), IGLU (Bos et al., 2010), TIMSS (Bos et al., 2008) studies for the school context or PIAAC (Statistik Austria, 2014) and AES (TNS Infratest, 2008) for the context of adults. Besides international scoring, the repeated measurements of these studies can disclose the impacts of educational systems, measures, and reforms.

A second motor for assessment, particularly with respect to formative assessment, lies in the Bologna process and its focus on learners' competencies (e.g. European Commission, 2007; European Parliament, 2008). The shift from teacher-centered to learner-centered didactics has consequences for the didactical methods as well as for the assessment methods: Here, it is not more appropriate to assess the content learned itself—the focus shifted to the assessment of competencies and respectively how far a learner can apply in knowledge in the context of application. This poses new challenges on assessors.

The ATS2020 project has relations to both approaches: As a project of policy experimentation, it will analyze assessment practices in Europe in a large scale study. However, assessment is also the subject of ATS2020 in the way that it develops practices and tools for the assessment of transversal skills. Therefore, ATS2020 will depend on the four possible results of an evaluation according to Stockmann (2000): It will get insights into European assessment practices and analyze data for decisions. It will furthermore evaluate

new styles of assessment for further refinement. Thereby, it will establish a dialogue between different stakeholders and give evidence for the impact and value of the new assessment methods.

This deliverable will provide ground for the second aspect and discuss new styles of assessment. It will specify functional affordances for assessment processes as well as for tools supporting these processes in a learner-centered scenario. According to the ATS2020 project proposal, it will

> *"Following the didactic implications of a formative assessment process in learning/assessment scenarios connected with ePortfolio or comparable learner-centred settings, the deliverable will specify the assessment process for self-assessment, peer-assessment and assessment by a teacher or another assessment authority, interconnected with the work carried out in WP1* (ATS2020 learning and assessment model)*."*

Thus, the deliverable depends on WP1 that specifies the assessment process and dimensions for the assessment of transversal skills and provides ground for deliverable 2.2, the analysis of particular tools for assessment. Figure 1 visualizes these aspects in the context of a formative assessment cycle. Thus, aspects discussed in WP 2 will relate to tools for the documentation of learning as well as with tools for assessment. Yet, within the formative assessment cycle, feedback by the teachers and/or peers as well as support for the creation or redesign of learning artefacts are essential aspects, that are in the scope of WP1 teacher and/or WP3 implementation. Two aspects of the figure are outside the formative assessment cycle but also essential for school practice and the research parts of this projects (WP5). They relate to the grading of learning for school reports and to a standardization of outcomes for international comparisons. Both aspects are essential for the project in the way that schools need evidence for students' learning at the end of the year and the project needs evidence for successful implementation at the end of the runtime. Yet, this standardization will relate to intra project comparisons rather than to programs for international student assessment like ICILS (Bos et al., 2014) in particular.

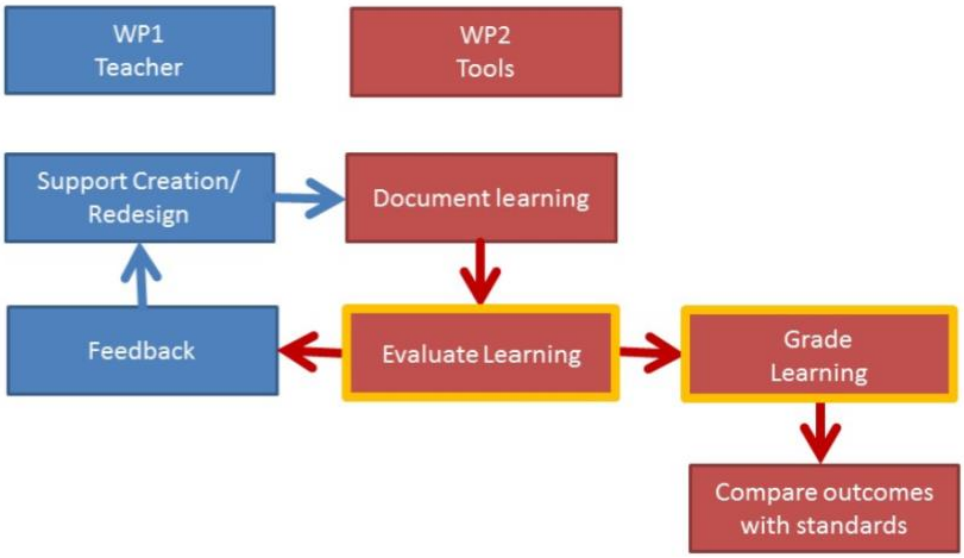

Fig. 1: Aspects of the formative assessment cycle with relation to the ATS 2020 work packages. (Bernhard Ertl, presented at ATS2020 WP2 workshop in Ljubljana, 2015-07-02)

ATS2020 will focus on the quality of the assessment environment and on learners' negotiation within this. It aims at improving and adapting an assessment environment and at showing the effectiveness and quality of this environment. Therefore, it follows the approach of Mandl and Hense (2007) that emphasizes the importance to learn about the particular functions and effects of an environment to realize best benefits for the learners.

In this contribution, we will first have a look on learning goals as they are the subject for evaluation and describe styles and bodies of assessment. The deliverable will then specify tools for assessment and illustrate the specifications on the basis of patterns.

2. Learning Goals and Consequences for Assessment

Learning goals are the basis for assessment in a similar way like assessment standards set the goal for students' learning (see e.g. Popkewitz, 2004). This deliverable will not discuss the personal impact of (not) meeting an assessment goal (see e.g. Schlag, 2006) but rather the systemic one that relates to teachers' and schools' attention. At least since the development of the European Qualification Framework (European Parliament, 2008) with the definition of competency levels, the inherent goal for teachers is to bring their students to meet the standards defined. Smith and Christensen (2004) discuss in this context the aim and function of the standards that no child is left behind. Yet, even if standards aim to provide a basis opportunity of equality (see Koschmann, 2004), there is the risk of assuming that all families have the prerequisites for meeting the standards and therefore these

standards are rather testing than remedying inequalities (Muller, 2004). This focus on standards is different to a focus on the individual and its personal talents. Therefore, we can observe some tension between a focus on the standards and a focus on the individual's talents (see e.g. Weilguny et al., 2011). This tension offers a perspective on a second dimension that relates to inclusion and excellence. Is it the idea behind the assessment to ensure students' inclusion in a way that that no child is left behind (like in Smith and Christensen, 2004) or excellence with the aim to identify and facilitate highly gifted students (see Rost, 2009). Weilguny et al. (2009) postulate that the education system should implement both, which means that it is up to the teacher to decide about the main focus of their teaching. This tension between equality and individuality also appears in a third dimension that relates to the valuation of outcomes. There is the approach of enrichment (Baum, 1988; Oortwijn et al., 2008; Troxclair, 2000) in the classroom that aims to facilitate optimal learning gains for the individual in contrast to an approach of competency levels that does not value efforts beyond the highest competency level. Figure 2 visualizes these tensions that have impacts on the goals for teaching and assessment.

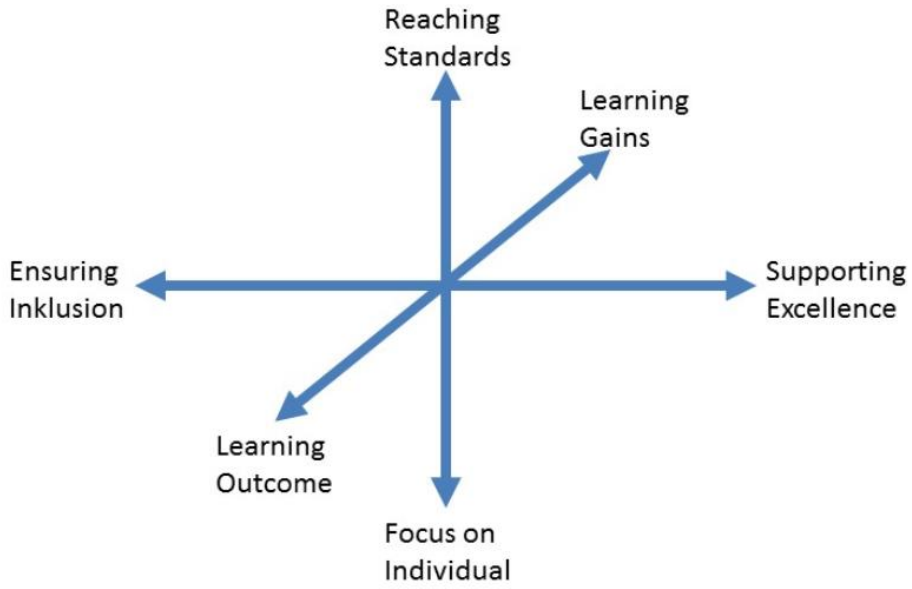

Fig. 2: Different types of goals for an assessment that have consequences for teaching and assessment procedures. Bernhard Ertl, presented at ATS2020 WP2 workshop in Ljubljana, 2015-07-02.

Figure 3 shows a slightly different visualization for learning goals and the focus of assessment. Here, the competency level, like from EQF (European Parliament, 2008) or PISA (e.g. OECD, 2007) relate to the broadest focus and ensures standardization with respect to international comparability. That means that all students on, e.g., Bachelor's degree (EQF level 6) or all students on PISA reading level V should be able to show the same competencies. Yet, such a broad focus can hardly be appropriate for individual peculiarities (see e.g. Muller, 2004). There are further educational standards with respect to

national curricula (e.g. Baumann, 2011 for standards in digital literacy in upper secondary). They focus on national comparability of educational outcomes and may therefore consider national specialties that may differ between the European member states. Outcome taxonomies (e.g. Anderson & Krathwohl, 2001) can be considered as tools for schools and teachers to define learning goals for their classes or individuals. They help to classify students' achievements in a defined context and provide options to take up local peculiarities.

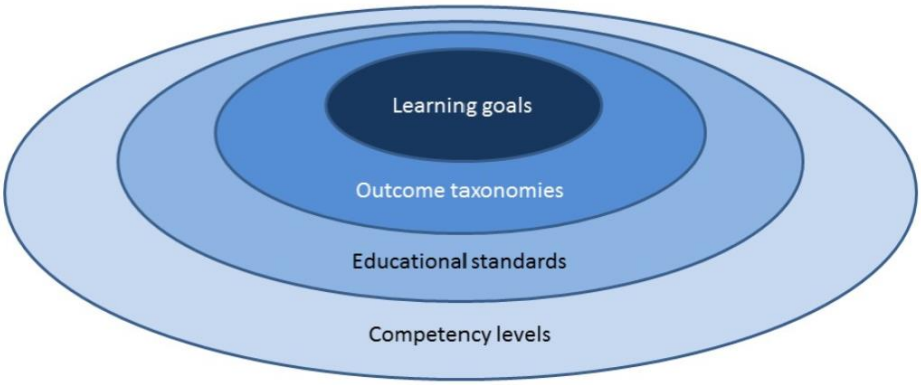

Fig. 3: Focus of assessment. Bernhard Ertl, presented at ATS2020 WP2 workshop in Ljubljana, 2015-07-02.

Finally, individual or class specific learning outcomes can provide the most appropriate focus for assessment. They define competencies a student or a class should develop during a learning event. Therefore, they are highly individualized but least comparable.

ATS 2020 partners come from 11 different countries with pilot implementation in 10 countries. All of them relate to the educational aims of the European Union and the respective legislation (e.g. European Parliament, 2008). Yet there are different national policies within this framework. The three dimensions of figure 2 affect the national implementations like in figure 3 in different ways and therefore it is essential for the ATS2020 project to consider these aspects as well as different positions of the partner countries.

2.1. Styles of Assessment

Affordances on assessment may be rather diverse and this results in different styles of assessment. In this context, we already mentioned the aspect of standardization and grading that usually assesses students' achievements at the end of a learning period (summative assessment). We also mentioned the perspective on individual learning gains that often relates to a formative process of assessment and feedback like in the feedback cycle described above (formative assessment). Besides, like mentioned by Stockmann (2000), assessment may also provide evidence for educational measures.

Even if there are different aspects and goals of assessment, they can be classified by two styles of assessment - a process oriented one and a product oriented one. They can be deducted from evaluation research (see e.g. Ertl et al., 2010). The process oriented one is called formative assessment, the product oriented is called summative assessment (see Scriven, 1980). Similarly to the Fitzpatrick et al. (2003) approach on program evaluation, formative assessment provides information for the individual's improvement. Different learning cycles (like the ones with "MyLearning", cf. Rupnik-Vec/Novak 2015) implement therefore processes of formative assessment with feedback and the redesign of learning artefacts (see also figure 1). Therefore, the aim of formative assessment procedure is to provide a basis and perspectives for further development of skills and competencies. Summative assessment aims at providing information for serving decisions about grading, and evidence verification. According to Scriven (1991), summative assessment serves to offer evaluative conclusions for any other reasons besides development.

Formative and summative assessment are two styles of assessment that may be applied either independently or combined. Fitzpatrick et al. (2003) propose a model for program evaluation. In this model, formative evaluation is primarily important at the beginning of the course development. However, it loses importance during several iterations of a course. In contrast, summative evaluation has only a marginal importance at the beginning of a course development. However, its importance increases with each iteration of the course and finally provides a basis for the decision about running the course once again or not. This model can be transferred to student assessment in the way that formative assessment is primarily important in the beginning of the learning period to offer the students ways for developing their skills (see figure 5). However, at the end of the learning period school systems often require grading, which results in summative assessment. This process is also reflected in our model of the formative learning cycle (figure 1).

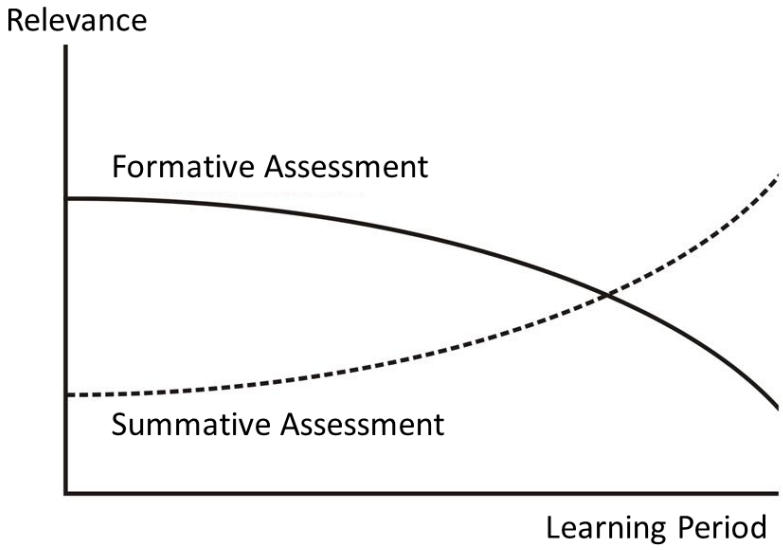

Fig.4: Relationship between formative and summative evaluation across life of a program according to Fitzpatrick et al. (2003).

2.2 Assessment Bodies

Goals and styles of assessment are also related to the issue which evaluators are chosen. They may be internal or external with respect to the institution in which the learning takes place (see e.g. Hense & Mandl, 2006; König, 2000). Thereby, internal assessors may be either the students themselves (self-evaluation; König, 2000), peers (e.g. Sluijsmans & Strijbos, 2010) or teaching/tutoring staff of the organization. External assessment may be executed by national assessment bodies, particularly when assessing high stakes exams or international studies.

Harvey et al. (2002) emphasize advantages and disadvantages of self-assessment. Considering the advantages, self-assessment is easy to handle. Students are usually very familiar to the peculiarities of their learning and this allows a focus on the specific aspects that are necessary for further development. Sluijsmans et al. (1999) resume that students perform well in self-assessment, particularly if they receive feedback over time. They report furthermore higher test scores of students doing self-assessment. With respect to the learning cycle, the aspects of reflecting more of the own work and providing a higher quality of products seem to be promoting self-assessment (see Sluijsmans et al., 1999). However, considering the discussion before, self-assessment provides the lowest level of comparability and standardization and is also highly dependent to attribution patterns and over/underestimations (see e.g. Ertl & Helling, 2010; OECD, 2015).

Peer assessment means that learning artifacts are assessed by peers. This often applies during collaborative learning when learners evaluate themselves with respect to their

learning progress. Peer assessment can have mutual benefits: for the learner receiving feedback to get insights into further development and for the learner giving feedback because it requires to analyze learning artifacts and elaborate areas for further development. This evokes processes of learning by teaching (see Renkl, 1997) that have proved to be beneficial in different ways. Peer assessment has often been applied within settings of formative assessment (see Sluijsmans et al., 1999). However, they also mention that it is dependent on friendship issues and therefore lacks in objectivity. With emerging online learning activities, and particularly in the context of MOOCS, new models of structuring peer-feedback emerged that claim to be also viable for summative feedback (see Sluijsmans & Strijbos, 2010).

The most common body for assessment in school context is the teacher him/herself ore a respective tutor. Teacher assessment usually provides a certain amount of objectivity with respect to the students in a class. However, assessing the own didactic endeavor comprises aspects of self-assessment (see e.g. Harvey et al., 2002; Hense & Mandl, 2006). Considering learner-oriented learning, a teacher can be considered as an assessment authority that is not involved in the learning process itself.

This also applies for assessment by an external assessment authority. In contrast to teacher assessment, external assessment may be more objective and more reliable, because it usually uses standardized tests and external assessors that are not involved in the teaching process (see Mandl & Hense, 2006). Yet, this also implicates that external assessment is least focused on individual progress and mainly involved in summative assessment.

To sum up, assessment can be clustered according to the style of assessment (summative/formative) and the bodies of assessment (self-assessment, peer assessment, assessment by an authority that may be either internal or external; see figure 6). The bodies of assessment can be divided more distinctly by assuming that the teacher is one authority, but that there might be an additional authority like a commission or external evaluators.

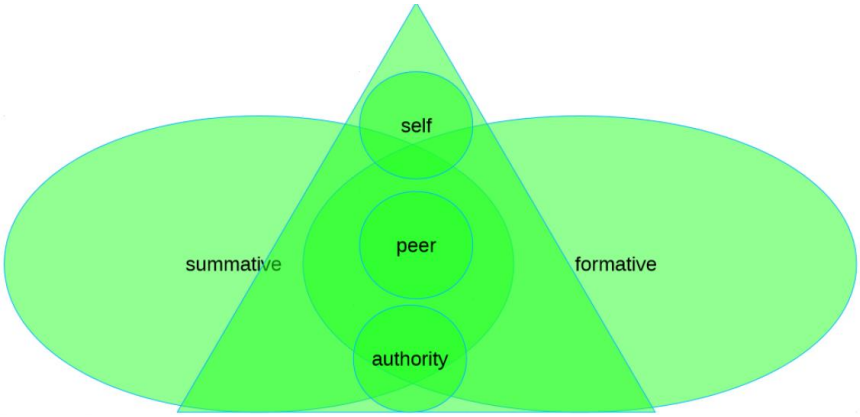

Fig. 5: Assessment in the context of assessment styles (summative/formative) and assessment bodies (self/peer/authority). Bernhard Ertl, presented at ATS2020 WP2 workshop in Ljubljana, 2015-07-02.

3. Tools for formative Assessment with a focus on ePortfolios

As stated in ATS2020 D.1.2, Bloom (1971) describes three types of assessment: diagnostic, formative and summative. Behavourist ("traditional") teaching is linked to summative assessment: students are graded for their reproduction of knowledge "transferred" to them by the teacher. Diagnostic assessment is used to show what a learner knows or can do – and also to show, what s/he does not know or cannot do (ATS2020 D.1.2).

Following a constructivist approach to teaching means focusing on formative assessment. Taking up the reflections in ATS2020 D.1.2 the ATS2020 project follows the insights of Brooks and Brooks (1999). They state that formative assessment (Assessment for Learning) responds to needs and characteristics of students learning. It is an ongoing process, in which teachers and students share responsibility. The process aims at an improvement of learning experience and learning itself.

The Eurydice Report (2011/12) on "Developing Key Competences in Europe" states, concerning the development of transversal competences:

> "Transversal competences call for new ways of learning and teaching which go beyond traditional subject boundaries. Corresponding assessment tools, which reflect student achievement acquired through different subjects, are necessary to evaluate the progress of students in these areas." (p.29)

Transversal skills – as in the focus of ATS2020 – will be tested by standardized tests only in order to evaluate the ATS2020 pilot. For the elaboration of transversal skills, an outcomes-based teaching design (ATS2020 D.1.1) is the basis for an approach to learning and assessment that is learner-centered and orientates at the learning growth of the learner.

Concerning the Tools for Formative Assessment, ATS2020 D.1.4 shows the following tools & technology for the following activities that support formative assessment:

FA strategies / T&T	1. Clarifying (understanding) and sharing learning intentions and criteria for success	2. Engineering effective classroom discussions and other learning tasks that elicit evidence of student understanding	3. Providing feedback that moves learners forward	4. Activating students as instructional resources for one another	5. Activating students as the owners of their own learning
Rubrics	•	•	•	•	•
Scripts	•	○	•	•	•
Blogs	○	•	○	•	•
Wikis	•	•	○	•	•
Concept Maps	•	•	○	○	•
ePortfolios	•	•	•	•	•
Computer-based Assessment	○	•	•	○	○
Classroom Response Systems	○	•	•	•	•
Technology-Enhanced Learning Environments	•	•	•	•	○
Learning Analytics and Educational Data Mining	_	•	•	○	•

TABLE 2 TOOLS AND TECHNOLOGIES FOR SUPPORTING FORMATIVE ASSESSMENT PROCESS

• – Highly supported by evidence-based research literature

○ – Supported by evidence-based literature under specific conditions

_ - Not supported by evidence-based literature

Fig. 6: Tools and Technology for Supporting Formative Assessment Process (ATS2020 D.1.4, p.52)

The table shows that ePortfolios are the technology getting high support in each of the dimensions of activities. Furthermore, they are an environment that allows to host other tools, such as rubrics – the other highly supported tool according to literature research carried out for ATS2020 D.1.4.

ePortfolios

To emphasize on the learner-centered approach and as suggested in D. 1.4 of ATS2020, ePortfolios will be the main tool used by students and teachers to document learning and to perform self-assessment, peer-assessment and assessment by the authority (teacher).

ePortfolios – as defined by the project EUfolio. EU classroom ePortfolios –

> *"are (student-owned) dynamic digital workspaces whereby students can capture their learning, their ideas, access their collections of work, reflect on their learning, share it, set goals, seek feedback and showcase their learning and achievements." (EUfolio 2015)*

In the EUfolio project, the implementation of ePortfolios led to a focus on formative assessment. (EUfolio 2015 & Rupnic-Vec & Novak, 2015). Rupnik-Vec & Novak state:

> *"The most important function of an ePortfolio […] is its developmental-reflective function, or its potential for supporting self-development in planning, and for reflective and self-evaluative processes of an individual." (Rupnic-Vec & Novak 2015, p.11-12)*

Klaus Himpsl-Gutermann has drawn a model for ePortfolio based learning that shows the ePortfolio process, but also allows making assessment throughout the learning process visible (Fig.7):

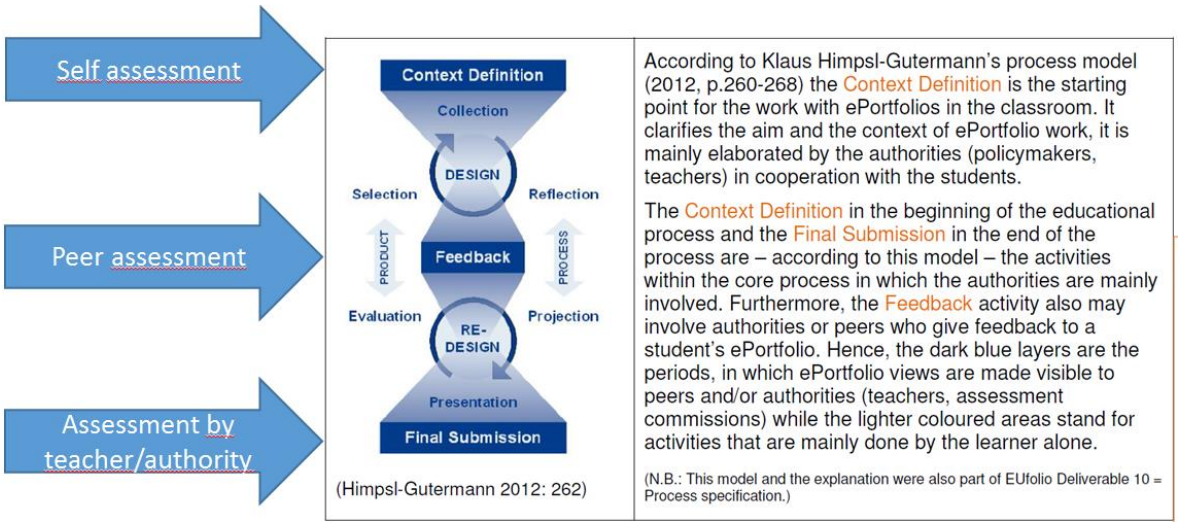

Fig. 7: ePortfolio model by Klaus Himpsl-Gutermann (2012) as shown and explained in Ghoneim/Herber (2014), enriched by pointing out the assessment activities in the ePortfolio process (from a presentation of Andrea Ghoneim at the ATS2020 WP2 ad hoc meeting in Ljubljana, 09/2015)

Figure 6 visualizes assessment aspects in the context of a functional requirement matrix for ePortfolios developed by the project EUfolio (Herber & Ghoneim, 2015).

As suggested in the figure shown below, ePortfolios may not only serve as a tool for formative assessment, they could also be assessed summatively and be the basis for grading. Furthermore they support the collection – and thus also the verification – of evidence and they could be used for evaluating attendance and reputation tracking.

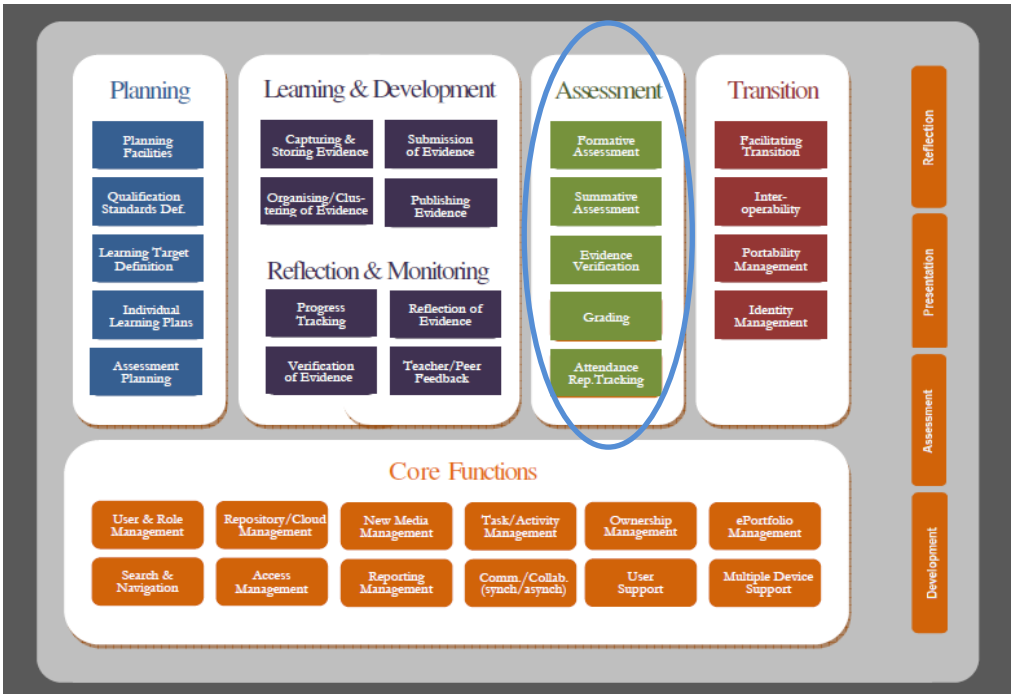

Fig. 8: The EUfolio functional requirements matrix (in Herber & Ghoneim 2015, p.[15]) shows functions of assessment in context of a functional specification for ePortfolios.

However, an ePortfolio is a suitable tool for collecting, organizing and contextualizing evidence of the growth of skills. As the acquisition of skills should rather be seen as an ongoing process (which should be accompanied by formative assessment) than as a product that can be assessed summatively, the main approach of ATS2020 will focus on the process and the formative assessment.

Furthermore, an ePortfolio can be used to collect the outcomes of (and reflections/assessments on) the work with different tools, such as the ones that were used to elaborate skills (like blogs or Wikis), as well as self-assessment questionnaires, rubrics, assessment statements of peers and an assessment authority and contextualize them with reflections on the assessments and notes on improvement.

The following table of the Scottish Qualifications Authority (SQA) shows the process of creating an ePortfolio for assessment. The table is addressed to the students.

Creating an e-portfolio for assessment

Activity	Task	Who
Planning your e-portfolio	Familarise yourself with the qualification	You - your Assessor will help you find information about the qualification
	Create an Assessment Plan for each Unit	You and your Assessor
Starting your e-portfolio	Familiarise yourself with your e-portfolio	You – your Assessor will help you access and learn to use the e-portfolio
	Set up your e-portfolio structure	You - your Assessor will advise you
Building your e-portfolio	Collect and create evidence	You - your Assessor will advise you on how to do this when you create the Assessment Plan. Other people could also be involved in helping you collect evidence - eg if someone needs to observe you carry out an activity and provide a Witness Testimony
	Select evidence to include in your e-portfolio	You - your Assessor may advise you
	Reflect on evidence	You
	Connect the evidence, referencing it to the qualification	You - your Assessor will advise you
Presenting evidence for assessment	Add your electronic signature and submit your e-portfolio online for assessment	You
	You may also want to create and deliver a presentation of some of the areas of the e-portfolio	You
Recording evidence	The e-portfolio will record the evidence you submit and lock the evidence until it has been assessed and internally and externally verified. Once assessed and verified the e-portfolio will record the outcome	Your Assessor will judge your evidence and provide you with feedback. If you achieve the Unit your Assessor will validate your achievement by adding his/her electronic signature
Maintaining the e-portfolio	Maintain and update your e-portfolio as you progress with the qualification	You

Fig. 9: (Table taken from SQA 2012, p.26). It was also used in Ghoneim/Herber 2014.

Conclusion

There are many tools to assess student's learning. If we try to cluster them, we can see tools for competence levels (like ICILS or the EQR), exercise-driven tools (to survey student's learning or to document the learning process and/or learning outcomes – for example ePortfolios) and evaluation tools (which mainly support the assessment process). Rubrics are usually an example for the latter, even though they frequently base on descriptors for competencies.

When focusing on formative assessment, a combination of exercise-driven tools and evaluation tools seems most appropriate. In order to get a picture of the transversal skills of a

student – and/or to allow her/him to get a picture of them her-/himself, an ePortfolio solution is the appropriate approach.

For the ATS2020 project, the ePortfolio will be a tool or, more precisely, the host of a tool combination that doesn't only support the learning process, but also serves the pilot evaluation, i.e., the gain of competences of teachers and learners can be likewise documented. To make this documentation visible to a researcher, owners of the ePortfolios (=their creators) need to grant access to their ePortfolios or parts thereof – for example by joining a group of “exemplar ePortfolios” and sharing their ePortfolio collections with the group or by providing links that enable a researcher to look into the ePortfolios and evaluate the gain of competences.

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- D. 1.4 Technology and Tools for a Formative Assessment Process

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