RE-EDUCO
REthinking EDUcation COmpetencies. Expertise, best practices and teaching in Digital Era

IO2 - Excellence in teaching, learning and skills development

Deliverable IO2.A6.1. Methodologies for learning for innovative online pedagogical approaches for non - formal learning (community) and online training

Authors: Dr Anthi Karatrantou, Dr Fotis Lazarinis and Dr Theodor Panagiotakopoulos
Organisation: Hellenic Open University
Date: 13/07/2021

HELLENIC OPEN UNIVERSITY

Erasmus+

RE-EDUCO - REthinking EDUcation COmpetencies. Expertise, best practices and teaching in Digital Era
2020-1-IT02-KA201-079433 | Co-funded by the Erasmus+ Programme of the European Union

RE-EDUCO REthinking EDUcation COmpetencies. Expertise, best practices and teaching in Digital Era

Co-funded by the Erasmus+ Programme of the European Union

Acknowledgements

Funded by the Erasmus+ Programme of the European Union

The RE-EDUCO project is co-funded by the Erasmus+ Programme of the European Union.

How to cite this report:

IO2 - Excellence in teaching, learning and skills development, Deliverable IO2.A6.1. Methodologies for learning for innovative online pedagogical approaches for non - formal learning (community) and online training, RE-EDUCO Consortium. Rome, DITES Research Centre, Link Campus University.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

RE-EDU-CO REthinking EDUcation COmpetencies. Expertise, best practices and teaching in Digital Era

Co-funded by the Erasmus+ Programme of the European Union

1. Student Centered Learning Techniques

1.1 Introduction

Education worldwide has undergone significant changes in the last 50 years. The traditional teacher-centered educational model, with teachers providing little or no space for student engagement opportunities to enhance their learning. In recent years, the traditional model in the classroom has changed dramatically. One of the most prominent themes in education is student-centered teaching and teachers today use a variety of student-centered learning strategies to equip and prepare successful citizens after students' graduation.

A student-centered approach varies greatly from the traditional teacher-centered instructional model. In a student-centered approach to learning, classrooms move from direct instruction to a more community-driven environment, one that supports student empowerment, conversations, critical thinking skills, independence, and problem-solving techniques. Student-centered learning strategies require and involve students in the overall planning process, implementation, and assessment of the lessons and the educational process. According to a student-centered approach, the teacher has a supportive and advisory role. The teacher acts as a "facilitator" and the focus of teaching shifts from the teacher to the student putting learners' interests first. In the classroom, students' actions and behaviors are characterized by self-action, initiative, cooperation, and joint decisions.

Nowadays, through the digital transformation and rise of educational technology, teachers have begun to make changes to instruction, assessments as well as the physical room of classrooms at a faster rate than expected using innovative tools. These tools can effectively support student-centered approaches and techniques during both face-to-face and online lessons.

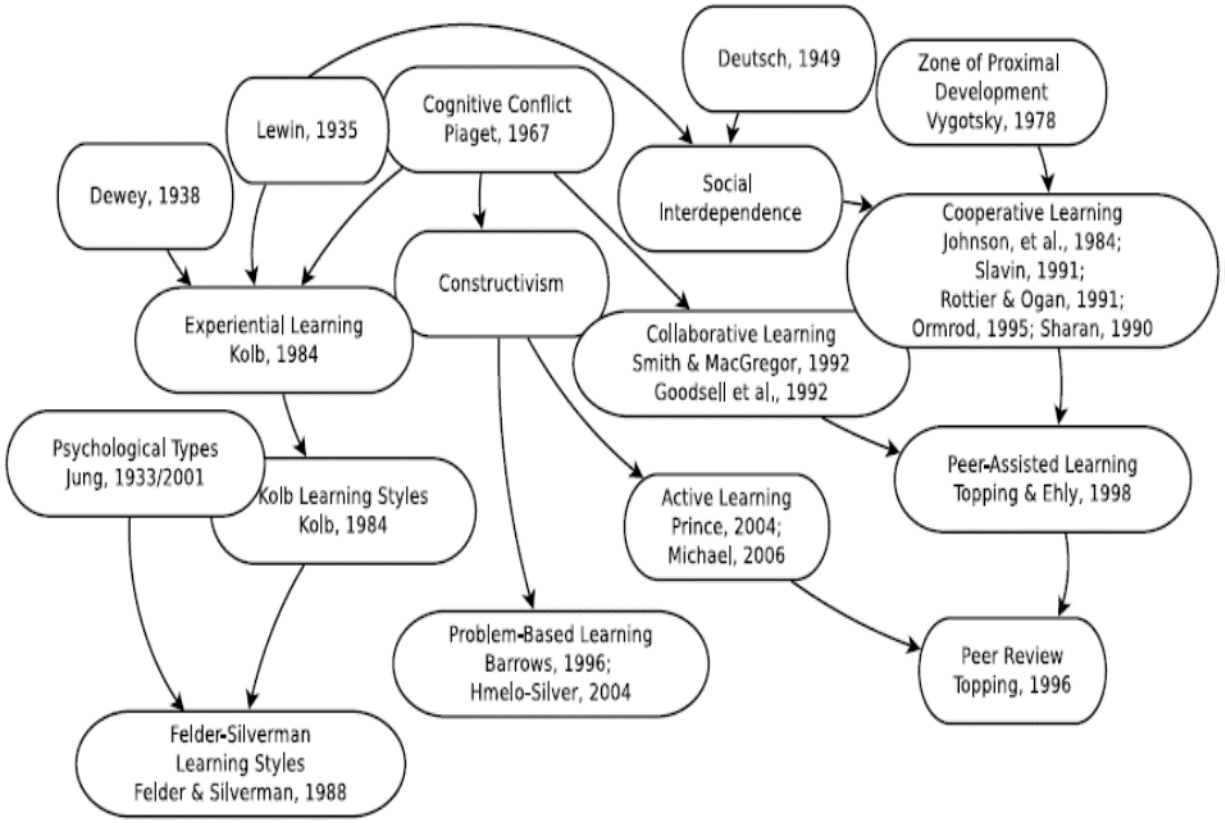
1.2 Definitions, basic concepts, and principals

There is a large body of relative literature but there is no agreed-upon definition for the overall concept of student-centered learning. Some theorists provide a broad definition "*students have a choice in their learning*," while others provide specific principles. Relatedly, there are also a number of programs that educators have implemented – *personalized learning, project-based learning, differentiated instruction, center-based classroom, Montessori, flipped classrooms, inquiry-based learning* - as a way to get to student-centered learning. Even though there is no agreed upon definition or singular program for realizing student-centered learning, the unifying theme is that in student-centered learning the model shifts from being adult-centered and standardized to student-

centered and individualized. Specifically, the learning *is personalized to the students' unique needs, interests, and aspirations, and designed with their ideas and voices at the table.*

Student-centered approach encourages students to be active in and to take control of their own learning. Student-centered approach (see figure 1) includes student-student collaboration, student reflection on their learning processes, and explicit instruction in the learning and thinking skills students need to effectively manage their learning in the present and future. Students are not on their own to decide what and how to learn. Through meaningful student-student interaction, students learn more in community with peers and others than they would during directed instruction. The role of the teacher continues to be to guide and structure the learning experience. Within a structure set by the teacher, students have choices and opportunities to reflect on the consequences of their choices.

Figure 1: History of Student-centered approach Chart example



Source: Kadry, S., Safieddine, F. (2016). Cooperative Active Learning Methodology in Mathematics. *Proceedings of EDULEARN16 Conference 4th-6th July 2016, Barcelona, Spain* pp. 4039-4045

Basic concepts and principals on which the student-centered approach is build are:

- The reliance on active learning

- An emphasis on deep learning and understanding
- Increased responsibility and accountability on the part of the student
- An increased sense of autonomy in the learner
- An interdependence between teacher and learner
- Mutual respect within the learner-teacher relationship
- A reflexive approach to the teaching and learning process on the part of both the teacher and the learner.

Student-centered learning is *Personalized*, is *Competency-Based*, Learning Happens *Anytime - Anywhere*, Students Take *Ownership* Over Their Learning, Students *incorporate* their interests and skills into the learning process.

Research shows that low income students who have positive relationships with their teachers have higher academic achievement and more positive social-emotional adjustment.

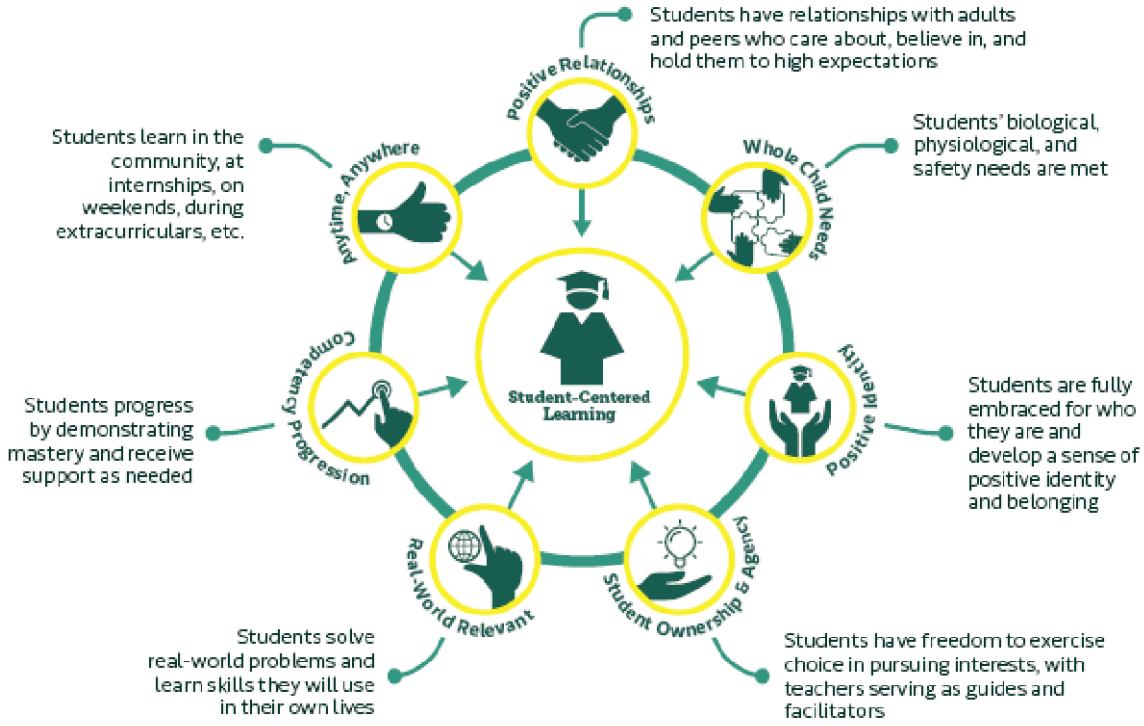
1.3 Principles Underlying Student - Centered Learning

The main principles of student-centered learning are:

- Requires an Ongoing Reflexive Process
- Does not have a One-Size-Fits-All Solution.
- Students have Different Learning Styles.
- Students have Different Needs and Interests.
- Choice is Central to Effective Learning.
- Students have Different Experiences and Background Knowledge
- Students should have Control Over their Learning.
- It is about Enabling not Telling.
- Learning needs Cooperation between Students and Staff.

Figure 2 presents principals that govern student-centered learning such as Positive Relationships, Whole Child Needs, Positive Identity, Student Ownership & Agency, Real-World Relevant, Competency Progression, Anytime – Anywhere.

Figure 2: Principals of Student-centered learning



Source: Kaput, K. (2018). *Evidence for Student-Centered Learning*. Education Evolving. Minnesota, USA. www.educationevolving.org

1.4 Choice of Teaching and Learning Methods

There are several strategies used in instruction in order to encourage this type of learning:

Making students more active in acquiring knowledge and skills: activities in classroom, fieldwork, and the use of computer-assisted learning packages, among others

Making students more aware of what they are doing and why they are doing it: using learning logs, analytical presentations

Focusing on interaction: use of tutorials, buzz groups and larger discussion groups and

Focusing on transferable skills: Looking beyond the immediate course requirements to other benefits to students later on in their careers and in life.

A number of teaching techniques for student-centered learning include:

- Buzz groups (short discussion in twos)
- Snowballing (turning buzz groups into larger groups)
- Cross-overs (mixing students into groups)

- Use of tutorial groups
- Rounds (giving turns to individual students to talk)
- Quizzes
- Writing reflections on learning (duration of 3-4 minutes)
- Student presentations
- Poster presentations
- Role play
- Students producing mind-maps
- Independent projects
- Group discussion
- Peer mentoring of other students
- Team work
- Debates
- Field-trips
- Practicals
- Reflective diaries, learning logs
- Computer-assisted learning
- Writing media articles
- Portfolio development

1.5 Developing a Student-centered Classroom

A student-centered classroom is one where the focus of instruction is shifted from the teacher to the student, with the end goal of developing students who are autonomous and independent, by placing the responsibility of learning in the hands of the students. Many proponents of student-centered learning would argue that it's one of the most effective ways to help students develop the skills required for independent problem-solving and lifelong learning. For a classroom to be a student-centered one advices as the following should be taken under consideration:

Turn the classroom into a community

In a student-centered classroom, the students speak, the teacher listens, interjects and facilitates conversation when needed, and then thanks the students for their participation. By involving students directly in the education process, and by enabling them to interact with one another, students begin to feel a sense of community. More importantly they are shown that what they feel, what they value, and what they think are what matter most.

Develop trust and communication

Trust and open communication are achieved by always being fair with students, listening to them, and allowing them to speak. Getting started at the beginning of the year sets the tone and lets students know what's expected of them the rest of the year.

Find ways to integrate technology

Developing a student-center classroom is all about engagement. In today's world, technology is one of the most effective tools for engaging students. Technology is not the future, it's the present. Everything students do these days revolves around technology–specifically mobile technology. Allow and invite students to use free web tools to present, curate, and share information. When students are given the opportunity to integrate existing web tools and technology into the learning process, they become eager, anxious participants in just about any learning activity.

Create an environment where mutual respect and a quest for knowledge guide behavior–not rules

Having an engaging classroom environment, with engaging projects, engaging activities and engaging discussions will foster mutual respect and encourage a pursuit of learning that leaves little time for disruptions.

Replace homework with engaging project-based learning activities

In the student-centered classroom, where activities and projects are engaging, students become much more eager to learn, and in class productivity is much higher. Where students complete school work outside of the classroom in a student-centered learning environment, it's typically because they want to complete projects they're working on inside the classroom.

Develop ongoing projects

Ongoing projects promote mastery of subject matter being taught and learned. Learning objectives and standards can be met through well-designed projects and activities providing students with various project choices allows them to demonstrate what they're learning.

Allow students to share in decision making

Creating a student-centered classroom requires collaboration. It requires placing students at the center of their own learning environment by allowing them to be involved in deciding *why, what* and *how* their learning experience will take shape. Before students will be willing to invest the mental, emotional and physical effort real learning requires, they need to know *why* what they're learning is relevant to their lives, wants and needs. *What* is taught and learned in a student-centered classroom becomes a function of students' interests and involves students' input and teacher-student collaboration. The *how* in a student-centered learning environment is just as important as the why and the what. Students process information, understand and learn in different ways.

Offering students the option of how they'll learn will allow each student to adopt the method of learning that will be most comfortable and effective for them. It also allows students to feel more invested in the learning process.

Give students the opportunity to lead

Providing students the opportunity to lead in the classroom is a great way to develop a student-centered learning environment that fosters engagement, growth and empowers students to take ownership of the learning experience.

Get students involved in their performance evaluation

The student-centered learning environment is based on a form of narrative feedback that encourages students to continue learning until they demonstrate they've achieved mastery of a subject. This form of learning, feedback and evaluation encourages students to resubmit assignments and work on projects until mastery is achieved.

1.6 Essential Elements of Student-Centered Teaching and Learning

Based on the literate worldwide essential elements of Student-Centered teaching and learning arose, such us:

Inclusive and Responsive Practices

To thrive in school and beyond, students must feel valued. Teachers create inclusive and responsive classrooms when they adapt to students' needs, build social-emotional skills, and honor diverse perspectives.

Flexible Instructional Models

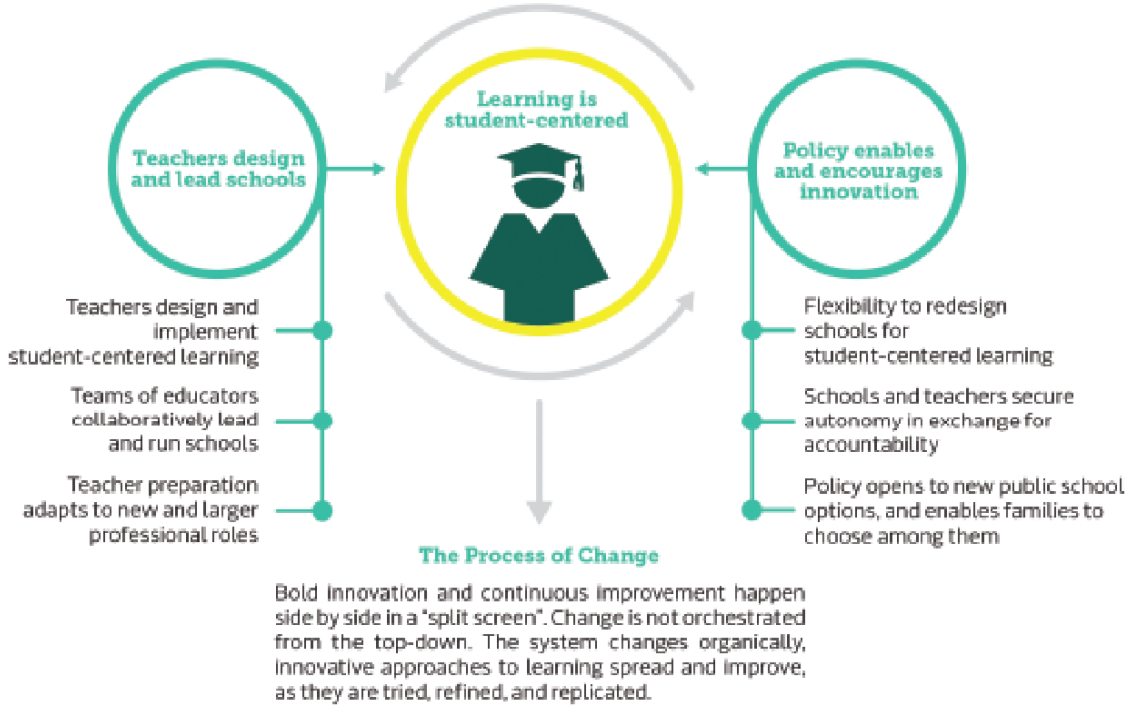
With new technology and instructional models, teachers can transform the student learning experience to make it data-driven, personalized, and continuously relevant.

Curriculum and Academic Content

When teachers effectively shift to more rigorous, student-centered curriculum, they can transform classrooms into engaging, productive, and joyful learning spaces.

Figure 3 presents in brief changes should be done for Student-centered teaching and learning incorporation in education.

Figure 3: Changes for Student-centered teaching and learning



Source: Kaput, K. (2018). *Evidence for Student-Centered Learning*. Education Evolving. Minnesota, USA. www.educationevolving.org

1.7 Professional Development of Teaching Staff

The role of the teacher is not only to communicate knowledge, but to act as initiator, frame builder and consultant. Professional development of teachers should be included as an important part of the scholarship of teaching and run in parallel to the active student-centered approach used for students to enable lifelong learning among teachers as well. The following are a few elements of good practice in professional development programmes for teaching staff.

Using an Interactive Student- centered Approach in Professional Development Programmes:

Participants of such courses become students in this process and learn how to design courses that promote active student-centered approach and information literacy in the classes that they teach. In this way teachers learn how to work towards effective student-centred learning over efficient teaching, to ground information literacy contextually rather than to offer general bibliographic instruction and to use inclusive multiple styles of learning over exclusive pedagogy.

Focusing Teachers' Knowledge about the use of Technological Tools in Learning:

Participants learn about using technology in a manner which is relevant to their subject-discipline and to their students, rather than in a random manner.

Using Constructive Criticism to Improve the Teaching Process:

Teachers are not only given the opportunity to develop their own approaches to learning in their respective courses but are also given the space to provide constructive criticism to their peers and share their experiences in a dialogue as a community of scholars.

Focusing on Problem-Solving:

Participants are asked to identify problems they have encountered in their teaching which are then discussed in order to identify potential strategies to overcome them. Learning by doing in professional development programmes respects the academic freedom of teachers to critically evaluate which practical mode of teaching would be better. This mirrors the freedom and the concomitant responsibility of any student engaged in a learning process which is student-centered.

Applying Ideas and Teaching Methods in Practice:

This can be applied by means of a group project which allows participants to try out and experience forms of interactive teaching in a supportive environment.

Be members of learning communities and communities of practice:

Be an active member of learning communities and communities of practice to discuss with peers, to exchange experience and good practices with other teachers, to learn based on the knowledge and the experiences of others.

2. Peer Assisted Learning Strategies

2.1 Introduction

Peer-Assisted Learning Strategies (PALS) is a kind of cooperative learning where students work in small groups to accomplish shared goals. Students with high ability will work together with students with low ability in solving problems, thus maximizing their own and each other's learning. PALS addresses the different learning needs of every student.

According to the first implementation of PALS, this cooperative learning technique pairs students together and gives them the roles of a "Coach" and a "Player". Teachers carefully partner a student with a classmate. The pair works on various activities that address the academic needs of both students and pairs change over time. PALS can be used across content areas.

PALS does not require special reading materials and consequently enables teachers to use the reading material of their choice. This offers teachers flexibility for incorporating PALS into various content areas. More recently, this technique has been implemented as a strategy for students with Learning Difficulties. The strategy provides direct opportunities for a teacher to circulate in the class, observe students, and offer individual remediation. PALS therefore allows for differentiated instruction via having partners work simultaneously on various teacher-directed activities. PALS focus mainly on peer tutoring, cooperative learning, and peer assessment.

2.2 Definitions, basic concepts, and principals

Peer-to-peer learning implies a two-way learning activity meaning: "*learning from and with someone else*". Peer learning is one of the most popular modern teaching methods internationally. The term first appeared in 1944 and continues to be used in this sense to nowadays, and very often appears in educational terminology denoting that educational practice in which students interact with other students to achieve educational goals. Peer learning and its results have been studied significantly in the school environment, while recently there has been an increase in interest in studying the implementation of peer learning in Higher Education and in Adult Education.

The strategic efficacy of PALS has been studied and evaluated over the past 35 years with hundreds of teachers to ensure that PALS' methods are feasible and effective in the classroom. Many but similar definitions have been created.

According to Topping (2007):

Peer Learning is "*The acquisition of knowledge and skills through active help and support between equal or suitable partners*."

'*Equal or matched partners*' are: "People from similar social groups who are not professional educators and help each other to acquire new knowledge"

According to Ehlers (2013):

"*Peers are essential to the learning process. Not only do they encourage your own learning process by providing recommendations for materials, links and any kind of content they have produced that you can use to introduce yourself to any topic, but they can also provide a reflection of your own learning, a matter of discussion and validation for yourself.*"

"*Either a peer is or should be, open-minded, perceptive and aware of his abilities and obligations in terms of effort, attention and pace of response. Peers are expected to possess very good correlation and self-criticism skills and to demonstrate good relationship management and deep knowledge in a specific subject area.*"

"*Members of a peer learning group are willing to share material, redesign existing material and create new knowledge. They have a clear goal to support each other in order to "grow" together. "The 'authority' (power) within the group is extremely rare and is based on a hierarchy of roles*."

"*In addition, transparency, along with the recognition and exploitation of common means of communication and business details, is essential for a team of peers to thrive. This is even more apparent as it is understood that sharing should not be limited to the exchange of learning products, but also the explicit exchange of experiences on learning processes, paths and projects.*"

In any case with PALS, every student in the class is paired, and each pair consists of one student who is academically stronger than the other. As a supplement to the core curriculum, PALS fits well with a variety of instructional approaches, and allows teachers to address a broader range of student developmental areas. The most important features of a peer-to-peer project are the recognition of the value and necessity of complex processes within the process itself, such as the creation, sharing, processing and willingness to be open and receptive to input from different people, fields. and directions.

Recent research has isolated at different Peer-to-Peer Learning models such as:

- *Peer Assisted Learning* which refers to the use of teaching and learning strategies in which learners learn at the same time from each other without the direct intervention of an instructor
- *Peer Assisted Teaching* in which there is a clear and consistent distinction between the role of instructor and learner, although all parties may be trainees. It is usually carried out by trainees at an advanced stage of training compared to their co-trainees, who in some way assume the role of educator
- *Reciprocal Peer Assisted learning* where learners act as educators and learners in a group with common interests

- *Collaborative learning* combines *Peer Assisted* teaching and learning but provides great flexibility in strategic practices that can be applied
- *Peer-mentoring* is an educational process in which a person (*mentor*) encourages and helps one or more, less experienced people (*mentees*), to develop their skills in a common field of interest.

Literature review of interventions for students with learning disabilities addresses student outcomes in nine domains: *alphabetics, reading fluency, reading comprehension, general reading achievement, mathematics, writing, science, social studies, and progressing in school.*

2.3 Using Peer Assisted Learning

Peer Assisted Learning (PAL) involves children in school consciously assisting others to learn, and so learning more effectively themselves. It encompasses *peer tutoring, peer modeling, peer education, peer counseling, peer monitoring, and peer assessment*, which are differentiated from other more general "*co-operative learning*" methods. PAL is not diluted "*teaching*" it complements and supplements professional teaching capitalizing on peer interaction and helping students become empowered democratically to take more responsibility for their own learning.

In practice, PALS has proven to be effective in the classroom for many reasons, some of which are presented below:

1. Teachers can target students who need more support.
2. Lessons are scripted, providing teachers with guidelines on how to introduce activities and engage efficiently with students.
3. Routines are simple, efficient, and remain the same throughout the program, creating a sense of familiarity.
4. The PALS structure provides for positive and productive peer interactions.
5. Paired activities create an opportunity for lower-achieving students to assume an integral role in a valued activity.
6. Students stay on task.

A teacher, in order to use PALS, has to incorporate teaching and learning into activities for students and to create an atmosphere of learning that caters to every learner's skills and abilities. Peer-Assisted Learning is designed to be accessible and useful to teachers and to those who employ, train, support, consult with, and evaluate them.

2.4 The PALS Strategy in the Classroom

The first step towards implementing the PALS strategy in the classroom is to obtain a baseline of all the students' strengths and weaknesses. They are then ranked according to their skills and abilities.

This information is used to carefully form student pairs- a student with a higher achievement/skill rating is paired with a student who has a low or average score .The pairing is put into place to encourage students to learn from each other through teaching and practicing.

Following the principle of Reciprocal Teaching, each student takes turns being a Coach and a Player. Coaches are instructed to observe, assist, and provide constructive feedback to the Players and are even given guidelines to follow. The pairs are regularly shuffled to give students the opportunity to learn and interact with others. It enables students to participate in various activities and allows the teacher to observe, supervise and give individual intervention when needed.

When equipped with peer reviewing techniques, students can rate each other on their effectiveness as a coach. Teachers can determine the effectiveness of the strategy by observing the students' behavior and learning behaviors such as student motivation and participation.

2.5 Characteristics of a PALS lesson

Based on the proposals of Topping (2007) a total of *13 organizational dimensions, 12 aspects of design* and *a theoretical model* of Peer Learning should be the basis to organize a PALS lesson:

1. Content of the syllabus
2. Network of contacts
3. Within or between the institutions and authorities
4. Year of study
5. Ability
6. Continuation of roles
7. Time
8. Space
9. Characteristics of those who provide assistance
10. Characteristics of those receiving assistance
11. Objectives
12. Voluntarily or compulsorily
13. Aid

Based on these criteria and the claim that peer learning should emphasize equality and equal opportunities among participating members, TOPPING has also created a list of aspects to consider when designing peer learning.

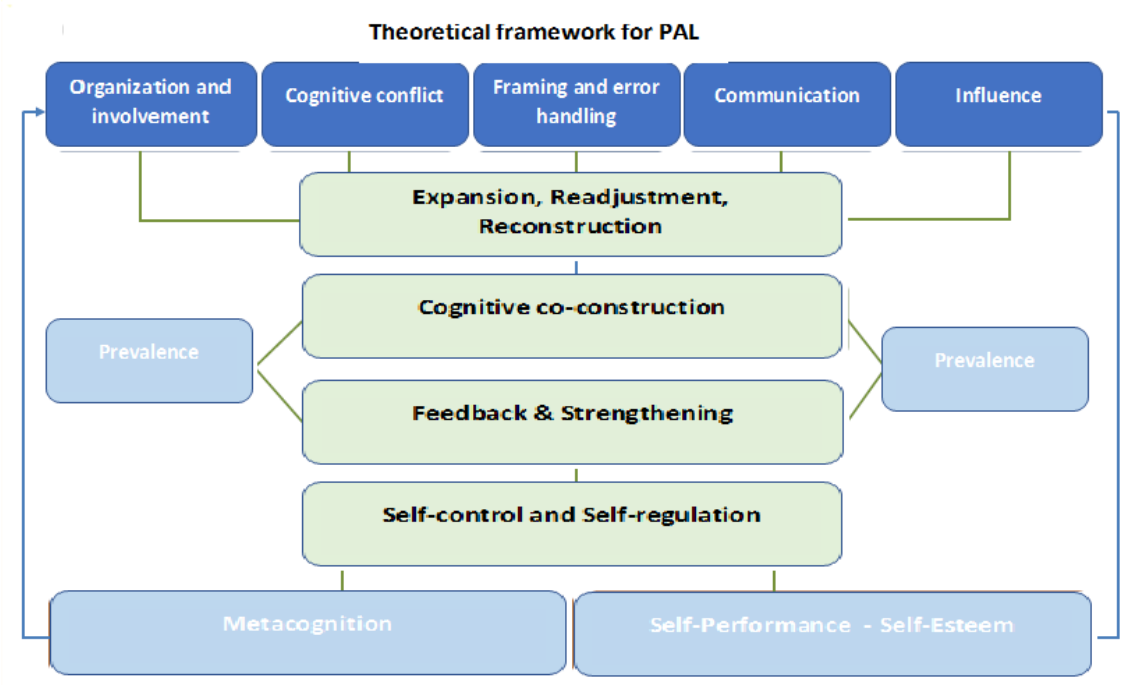
1. Content
2. Objectives

3. Area of educational content
4. Participants
5. Assistance technique
6. Contact
7. Materials
8. Education
9. Process monitoring
10. Student assessment
11. Evaluation
12. Feedback

2.6 Theoretical model

Topping & Ehly (2001) created a model that offers a good basis, based on the synthesis of conclusions of existing research.

Figure 4: The PAL Framework



Source: Topping, K.J. and Ehly, S.W. (2001) Peer Assisted Learning: A Framework for Consultation. *Journal of Educational and Psychological Consultation*, 12, 113-132

PAL provides equal opportunities for all participants and has a comprehensive base. Everyone can participate which makes people feel valued and worthwhile. People who are helped are more likely

to help others in the future. Those who help must have a deep knowledge of the subject, something that has a positive effect on their skills, while indirectly acquiring additional skills in providing assistance, communication, etc., which in turn are transferable.

2.7 Conclusions

Peer Assisted Learning has multidimensional dynamics. To make use of this dynamic it is important to understand and apply an effective learning environment. This environment must be specifically designed for the purpose for which it will serve. Theoretical or conceptual models are particularly important for such a creative process. Evidence shows that peer learning has a positive effect on academic achievement and there is a gain in transferable social and communication skills as well as emotional functionality that makes it an efficient learning strategy (high impact with low delivery costs).

Peer Learning often is implemented but the internet services and tools provide new possibilities, based on the same idea and criteria. To have a successful peer group in the internet environment each member must meet basic requirements and active participation is required in the learning process.

3. Technology Enhanced Assessment Tools

3.1 Student assessment

Student learning requires assessment and the feedback that comes with it. However, you may discover that the areas of assessment related with quality assurance consume more of your time than the ability of the assessment to promote students' learning. Aside from the obvious benefit of providing a measure of students' progress, well-designed evaluation can also be used to engage pupils. Assessments are divided into two main categories:

- *Summative assessment*: Summative assessment is used to assess student learning at the end of a unit of instruction by comparing it to a standard or benchmark (Dixson & Worrell, 2016). Summative assessments are frequently high-stakes, which means they are worth a lot of points. A midterm exam and a final year project are examples of summative assessments.
- *Formative assessment*: Formative assessment is defined as "the process used by teachers and students to recognize and respond to student learning in order to enhance that learning, during the learning" (Cowie & Bell, 1999). Formative assessment happens within the duration of an educational program to support the learning process of students.

Apart from these two main categories various types of assessments have appeared in the literature:

- *Adaptive assessment* refers to the ability of testing tools to adapt the testing process to the abilities or goals of learners. The most commonly applied adaptive test is CAT (Computer Adaptive Test) where the presentation of each item and the decision to finish the test are automatically and dynamically adapted to the answers of the examinees and therefore on their proficiency (Thissen & Mislevy, 2000). Alternative adaptive testing tools have also been proposed which focus on factors such as the competencies of the learners (Sitthisak et al., 2007) and their goals and current knowledge (Lazarinis et al., 2010).
- *Self-assessment* is a formative assessment process in which students think and evaluate the quality of their work and learning, judge the extent to which they explicitly reflect the goals or criteria they have set or the teaching process they participate in, identify the strengths and weaknesses of their work and review accordingly (Andrade & Du, 2007).
- *Peer assessment* is defined as the process by which groups or individuals rate their peers. In other words, students are involved in one of the processes that in traditional teaching are carried out exclusively by the teacher, enhancing the shift of the center of gravity of teaching from the teacher to the students (Falchikov, 2007).
- *Collaborative assessment* is when two or more learners attempt to assess some aspect or aspects of their own learning together. In other words, the focus in a collaborative assessment is on what the group thinks they have learned (Ioannou & Artino, 2010).

Other terms and categories like competence assessment, goal-based assessment, diagnostic assessment, personalized assessment etc. have appeared in the literature.

3.2 Technology Enhanced Assessment

Innovative assessment procedures and systems that use technology to support the management and delivery of assessment are referred to as technology-enhanced assessment (O'Leary et al., 2018). Technology-enhanced assessment (TEA) (referred also as computer assisted assessment or computerized testing or technology supported assessment), for example, uses a variety of technologies to deliver questions (e.g., via computers, laptops, tablets, and smartphones), to allow students to interact with questions (e.g., by watching videos, taking digital notes, viewing closed captions, and highlighting and zooming in on text), and to provide prompt feedback and score reporting (e.g., automated essay scoring).

Assessment plays an important role in every learning and teaching activity. TEA is a broad term that includes the diverse methods by which technology can be used to support the management and delivery of assessment. TEA is a more complex procedure than simply replacing existing assessments with digital versions. It makes use of technology to tackle some of the operational and pedagogic issues of assessment. It is therefore a method of supporting the pedagogy and best practice relating to assessment.

In the framework of a systematic reform of educational systems, technology enhanced assessment could play a significant role in satisfying the needs shaped by the digital world. Such an assessment, if pedagogically rather than technologically driven, can enable a new view of learning characterized by:

- A focus on the learner. The classroom environment fosters active participation from students.
- Learning that is tailored to the individual. Individual differences are taken into account in the learning environment.
- Learning is a social activity. Scaffolded cooperative learning is encouraged in the learning environment.
- High-level skills such as creativity, problem-solving, and linguistic and verbal thinking are emphasized. One of the most significant shifts in the move from traditional school to digital society is the underlying learning paradigm.

Information and Communication Technology makes assessment easier in novel learning environments, with new options ranging from simple web-based self-assessment through group work evaluation to current advances in semantic analysis for automatic diagnosis. Examples of these new possibilities are:

- Social constructivist techniques use new ways (peer assessment, self-assessment, etc.) as well as methodologies and instruments to evaluate learning processes based on participation, cooperation, and output.
- Evaluation within communities of practice, which gives feedback and shared meanings that are necessary for membership.
- New sorts of questions and adaptive delivery mechanisms are used in more sophisticated evaluation methods and instruments.
- Using Web 2.0 tools, assess high-level skills and competencies.

3.3 Types of technology-assisted assessment

Technology-enhanced exams, unlike traditional paper-pencil tests, have provided unexpected benefits to both students and teachers. Reduced test costs, improved scoring, flexible test dates, and timely diagnostic reports are just a few of the advantages (Bennet, 2015). Technology-enhanced exams are frequently classified according to how far they have progressed, or how different they are from traditional paper-based evaluations.

Technology-enhancement evaluations are divided into three classes, according to Bennet (2015).

- The first class relates to examinations in which standard questions (e.g., multiple-choice questions) are displayed on a computer screen. In this stage, assessment systems frequently allow pupils to input answers on electronic devices such as a keyboard or a tablet.
- Innovative question types are frequently included in the second-class systems in order to maximize the quantity and quality of interactions between students and questions. Questions, for example, can be provided in a variety of formats, such as video, hypermedia, or a simulation environment. Such questions are designed to provide an authentic assessment environment by allowing students to apply their knowledge in real-world situations.
- Learner models (or student models) are used to drive decisions on assessment design, content, and format at the final stage, allowing us to deliver a more engaging assessment environment for students.

3.4 Categories of assessment methods

Technology-enhanced assessment tools and systems that are flexible, can be used without burdening students or teachers, enable constant interchange, and connect assessment and learning processes, are therefore needed (Redecker & Johannessen, 2013). Below we list different categories of tools used in assessments:

- *Quizzes, tests, and exams*: they refer to tools which support classical types of questions like true/false, multiple choice, fill-in-the gaps, etc.

- *Concept Maps*: a concept map is a diagram with nodes that are labeled with concepts and are organized hierarchically. The nodes are connected by directional lines and arranged in a hierarchy from general to specific. A diagramming technique for assessing how well students see the "big picture".
- *Knowledge Survey*: knowledge surveys are made up of a series of questions that cover the entire course topic. Students' learning and material mastery are assessed at all levels, from basic information and understanding to higher levels of reasoning.
- *Portfolios*: Portfolios are long-term, individualized records of a student's mastery of course material. Student reflection on their own learning and progress toward mastery of the subject reflected in the portfolio is an important component of portfolios.
- *Oral or Poster Presentations:* presentations are often used to assess student learning from student individual and group research projects.
- *Rubrics*: they are written criteria that specify what students must know and be able to do in order to obtain a specific grade. Rubrics assist instructors in developing clear learning objectives for their students, and if given to students before the activity, they can use them to direct their efforts.
- *Peer Review*: students assess each other's written work and oral presentations as part of peer review.
- *Written Reports*: written reports are often used as a form of assessment. Written reports can range in length from a short minute paper to a semester paper.

3.5 Examples of technology enhanced assessment tools

Technology enhanced assessment tools are software applications for designing and implementing assessments which help teachers to determine a student's academic abilities, skills, and/or fluency in a subject area, as well as their progress toward academic mastery in that subject area. Educators utilize assessment tools to make informed decisions about student learning practices. Below we provide a list of, mainly, free tools for educators which support assessment:

Hot Potatoes *(https://hotpot.uvic.ca/)*: The Hot Potatoes suite includes six applications, enabling you to create interactive multiple-choice, short-answer, jumbled-sentence, crossword, matching/ordering and gap-fill exercises for the World Wide Web. Hot Potatoes is freeware, and you may use it for any purpose or project you like. It is not open-source.

SurveyMonkey (*https://www.surveymonkey.com/mp/quiz/*): With this tool teachers can create surveys, quizzes, and polls for any audience. The results can be automatically analyzed and exported for other applications.

Quizzes with Google Forms (https://forms.google.com/): Google forms support automatic summaries for all quiz responses and provides frequently missed questions, graphs marked with correct answers and average, median, and range of scores.

Kahoot *(https://kahoot.com/)*: It supports game-based approaches to learning and assessment. Students can plan the assessment games by themselves or as a team, and teachers can add multiple choice or true/false questions to the games. The games are timed and scored, with point scales set up by the teacher.

Free Online Surveys *(https://freeonlinesurveys.com/free-online-quiz)*: this is a popular tool for quickly creating online surveys, generating online polls and forms.

Online Quiz Creator *(https://www.onlinequizcreator.com/):* it helps teachers to create fun-to-play quizzes with advanced features, styling options and statistics. Online Quiz Creator integrates several gamification elements, social features and learning principles.

Easy Test Maker *(https://www.easytestmaker.com/):* an online test generator to help teachers create and manage quizzes. Easy Test Maker provides the tools to format multiple question types, print alternate versions, and publish to the web. Online tests are automatically graded.

H5P *(https://h5p.org/)*: makes it easy to create interactive content by providing a range of content types for various needs. Interactive videos, Drag and Drop exercises, Drag the Words assignments, and other types of content can be produced in HTML5 and they could be integrated in various learning tools or run online.

Peerstudio *(https://www.peerstudio.org/)*: it automates the peer assessment process, making it easier to hold more frequent peer assessments that return real feedback to students so they can improve their team skills.

Rubric Maker *(https://rubric-maker.com/)*: simple and easy to use tool to create rubrics. It does not require registration and is totally web based. You can create and customize your rubric the way you want and when you are finished you can print and share it with others.

MindMup *(https://www.mindmup.com/)*: unlimited mind maps can be created for free, and are stored in the cloud. Your mind maps are available everywhere, instantly, from any device.

Miro *(https://miro.com/)*: an online collaborative whiteboard platform to bring teams together. It supports the creation of concept maps, brainstorming, workflows etc.

Different testing tools are also integrated in video conference tools like Webex, Zoom, and Big Blue Button and in Learning Management Systems like MOODLE and eclass.

3.6 Conclusions

In the previous sections we defined the concept of assessment and the different assessment types and techniques. We enumerated the benefits of technology enhanced assessment and we referred

to how technology can improve assessment. Various forms of assessments have been listed and tools for supporting these types of assessment are presented. Technology enhanced assessment differs from pen and pencil assessment as more types of content and techniques are available and increased interaction and real time support and feedback are possible.

4. Technology Centered Learning Techniques

4.1 Introduction

The use of ICTs as mediating devices to support student learning, include aspects of assessment, tutoring, and instruction. Web-based learning, computer-based learning, virtual classrooms and learning environments, and digital collaboration are only some of the applications and procedures involved. It entails the delivery of content via a variety of electronic media (e.g., the internet, intranet/extranet, audio-and videotape, satellite broadcast, interactive television, and so on) as well as access to resources that inform learners of new ideas, which they can then reflect on and integrate into their existing knowledge.

Computers can be used to facilitate collaborative learning practices, in which students are encouraged to negotiate shared meaning and work as a team rather than competing for a common objective. Web logs (blogs) and wikis, for example, are social media and social software applications that provide new ways to communicate, access knowledge, create content, and collaborate online. When integrated into curriculum design, appropriate use of technology is expected to encourage the development of new teaching techniques as well as enhance and enrich learning experiences. 'E-learning' (or 'electronic learning') and 'digital learning' are other terms for the same thing.

4.2 Technology Enhanced Learning

The application of technology to teaching and learning is referred to as technology-enhanced learning (TEL). It is a wide term with no clear definition, yet it is altering education and educational institutions in profound ways. As a result, it's difficult to dismiss it. For a variety of reasons, technology-enhanced learning is critical. It is significant not only because it is the current educational norm, but also because it has the potential to improve education.

Put simply, technology enhanced learning refers to "the use of technology to maximise the student learning experience". It has certain advantages for students:

Students can study at their own speed.

We all know that children learn at their own rate, and the typical classroom can make this difficult. Children can learn at their own pace as a result of technological advancements in schooling. Individuals who require further time can spend more time going over activities until they comprehend them, while students who require less assistance can proceed. It also frees up the teacher to assist students who require further assistance on an individual basis.

Additional resources

Educators are no longer restricted to the textbooks provided by their schools or universities when using TEL. Students can study in a variety of ways by utilizing various resources such as video, audio, and interactive learning. Teachers can come up with innovative strategies to engage their students in learning. Learning is now more hands-on as a result of technological advancements.

Students are kept occupied by technology.

Students have a hard time staying focused or interested in activities that aren't participatory. Even the most tedious educational chores may be made more entertaining with TEL, which will help your pupils stay focused.

To succeed in the real world, technology is required.

The reality is that without technology, it is nearly impossible to survive in the working world. As a result, it is preferable for children to learn how to use technology sooner rather than later. Being computer literate may be more important than some of the more traditional skills taught in schools.

4.3 Trends and aspects of TEL

Learning design

Learning design is a set of activities connected with better explaining, understanding, supporting, and leading pedagogic design methods and processes. It is about assisting instructors in managing and responding to new viewpoints, pedagogies, and work practices that emerge, to a greater or lesser extent, as a result of new uses of technology to support teaching and learning. It entails shifting the attention away from the teacher and onto the learners themselves – who they are, what they know, how they think, and how to effectively reach them so that they get the most out of their educational experience.

Instructional design

Instructional design follows a methodology such as ADDIE (https://en.wikipedia.org/wiki/ADDIE_Model) and guides a student through a carefully studied series of procedures to reach the learning outcomes (Analyse, Design, Develop, Implement and Evaluate). Of course, instructional design incorporates parts of this concept.

Despite the fact that instructional design predates the concept of learning design, there is still a lot of disagreement over how the two differ. Instructional design transforms the teacher's curriculum into learning activities and, in particular, materials (instructions) that the learner will interact with, almost always alone on an e-learning platform. Learning design considers what the learner should achieve and creates activities and maybe resources for presentation in an educational context, almost always in collaboration with peers, employing technology (a learning environment). This could be e-learning, blended learning, or something else entirely.

E-learning

E-learning is a learning approach that is based on formalized instruction but uses electronic resources. While education can take place in or out of the classroom, E-learning is primarily dependent on the use of computers and the Internet.

Flipped learning

Flipped learning occurs when students engage with course information online (for example, by watching a video) before meeting with the teacher in person (when the traditional lecture might have been held).

MOOC

A Massive Open Online Course (MOOC) is a few weeks long online course. MOOCs are the logical heirs to Siemens and Downes' earlier connectivism, which maintained that the Internet and the World Wide Web provided new potential for informal learning from high-quality free resources and from one another. Institutions typically bundle MOOCs on sites like FutureLearn and Coursera, both for altruistic reasons and to highlight specific offers. MOOCs are distinguished by the large number of students who can participate in a single cohort, which can number in the thousands. These levels of participation are possible due to online technologies. MOOCs are also free and accessible to everybody.

Blended learning

Blended learning combines face-to-face encounters with online activities and employs "different techniques to deliver learning." The important thing to remember is that rather than standing alone, interactions and online activities must feed into and support each other (i.e. the learning that is done). As a result, just recording face-to-face lectures and then running seminars as usual is not blended learning (although this model has value in itself, perhaps by offering flexibility of study for busy students). Students could participate in a discussion forum with their peers about concepts provided in a recent article as part of a blended learning opportunity, and then bring their replies into the seminar for further discussion and debate.

Open Educational Resources (OER)

"Free and freely licensed educational materials that can be used for teaching, learning, research, and other purposes" are the terms used to describe OER.

They are based on "the simple and strong premise that the world's information is a public good and that technology in general, and the Web in particular, provide extraordinary opportunities for everyone to share, utilize, and reuse knowledge." (creativecommons.org) In terms of teacher utility, it's pointless to spend time generating new resources when you can just adapt an existing OER in

the same discipline. OER can range from a single item, e.g. a picture to a complete course or program.

The Creative Commons licensing (https://creativecommons.org/licenses/) policy underpins OER. There are a variety of CC licenses available, but the general rule is that if you use an OER, you should credit the source/author (s). If you make changes to the OER and create something new, you should share it with the community so that others can benefit from it.

Learning Management System (LMS)

A learning management system (LMS) is a software application used to manage, track, report, automate, and deliver educational courses, training programs, or learning and development programs. Using analytical data and reporting, learning management systems were created to identify training and learning gaps. LMSs are mostly used for online learning, but they can also be used for a variety of other purposes, such as serving as a platform for online content, such as asynchronous and synchronous courses. An LMS may provide classroom management for instructor-led instruction or a flipped classroom in higher education. Intelligent algorithms in modern LMSs create automated course suggestions based on a user's ability profile and collect metadata from learning materials to make such recommendations even more accurate.

4.4 Tools for supporting Learning

There are a variety of resources accessible to the teachers to use in their teaching to improve your students' learning experiences. The goal of these tools is to give your teaching style more diversity and flexibility. These can be used in a variety of ways, both online and in the classroom.

Moodle

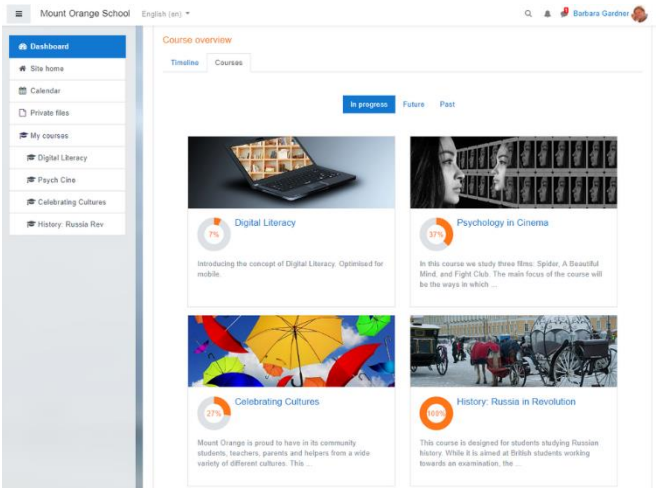
Moodle (Modular Object-Oriented Dynamic Learning Environment) is a freely available learning platform designed to provide educators, administrators and learners with a single robust, secure and integrated system to create personalized learning environments. Basically, it supports the delivery of various types of learning content (e.g. video, PowerPoint presentations, PDF files, images etc.) allowing the management of users and the assignment of them to specific groups following specific learning paths.

MOODLE enables educators to manage the entire learning process (see Figure 5 for a Moodle dashboard example). In particular, it provides the following possibilities, among other more specialized ones:

- existence of distinct roles (administrator, course creator, instructor, student, visitor),
- ability to build courses with predefined templates,
- integration of discussion and announcement spaces,

- use of teaching materials in different formats (text, audio, image, video, web pages, etc.),
- existence of multiple types of activities,
- ability to monitor the educational process and define conditions for completing the material,
- ability to customize the visual environment of the application for the most effective and personalized lesson planning.

Figure 5: Moodle dashboard example



Source: https://upload.wikimedia.org/wikipedia/commons/2/2e/MoodleDashboard.png

Each MOODLE lesson contains a variety of learning object types, for example:

- Questions of different types and quizzes
- Discussion and conversation areas
- Assignments that trainees must submit
- Material in the form of a book with chapters
- Websites, files of various types and entire folders
- Surveys, glossaries, Wiki etc.

Zoom, Webex, Big Blue Button, Adobe Connect, Google Meet and Microsoft Teams

These are some of the most popular video meeting platforms which are used for synchronous learning actions. They support the synchronous delivery of lessons to students, they allow the sharing of various learning materials, and they have functionality (e.g. polls, hand raising, chat) which makes it easy for students to interact.

Edmodo

Edmodo is a social network that integrates an educational tool that connects teachers and students. Among other things, teachers can use this one to create online collaborative groups, administrate

and supply instructional materials, assess student performance, and interact with parents. Edmodo has over 34 million users who connect to build a more enriched, personalized, and aligned learning process that takes advantage of the opportunities provided by technology and the digital environment.

Animoto

Animoto is a digital platform that allows teachers to quickly and easily make high-quality films from any mobile device, exciting pupils and helping to improve academic teaching. Teachers can generate audiovisual content that conforms to instructional needs using the Animoto interface, which is user-friendly and practical.

Kahoot!

Kahoot! is a game-based and question-based educational platform. Teachers can use this tool to generate questionnaires, conversations, and surveys to go along with their academic teachings. The information is shown in the classroom, and students answer questions while simultaneously playing and learning. Kahoot! encourages students to learn through games, which boosts student engagement and produces a dynamic, sociable, and enjoyable learning environment.

G Suite

Google's cloud-based apps and tools is probably the best set of tools to be used in e-learning. Drive, Classroom, Gmail, Calendar, Docs, Slides, Sheets, Meet, Keep, Tasks, YouTube, Forms, Jamboard, Drawings, Maps, Earth, News, Scholar, Photos, and Sites, are utilized almost daily for teaching and learning.

Padlet

Padlet is a digital pinboard that allows participants (students and teachers) contribute by pinning different images, videos, text files, links, and more. It allows students to share ideas and responses quickly and easily in a way that is visible to everyone in real time on a single screen.

Quizlet, Quizizz, Gimkit and similar tools

These tools offer unique strengths and features that engage learners, build understanding, and provide educators with real-time information on student learning and comprehension. The tools support the building of interactive activities, like quizzes, flashcards, etc. that are more engaging for the learner.

Edpuzzle

With Edpuzzle teachers can customize regular videos with engaging interactive learning tools. They can even track students' actions and progress with this tool.

Prezi

Prezi is a digital software for creating interactive presentations. When compared to PowerPoint presentations, Prezi's novel approach of helping someone prepare presentations - by zooming - results in more effective, compelling, effective, and interesting presentations.

Scratch

Scratch is a programming language that can be used by people of various ages, despite its primary focus on schoolchildren. Students can use this digital tool to create fun projects including games, animations, interactive art, storytelling, and more.

Storybird

Storybird is a digital tool for writing stories in a visually appealing way, thus motivating students to write and read stories. Storybird uses artwork to inspire people to write. There are various types of stories that engage differently aged students. There are picture books for kids in kindergarten through fifth grade, chapter books for students in grades five through nine, and poetry for everyone. This software improves the brain's ability to connect words and images.

5. Module Design - Carpe Diem Workshops

5.1 Introduction

A Learning Design describes the educational process as a whole teaching/learning experience. It's a formal description of a pedagogical scenario and that may or may not follow an instructional design model. A learning design describes learning objectives, *who* does *what* and *when* using tools and resources, and outcomes. The process of learning design refers to the activity of designing units of learning, learning activities or learning environments. It could be stated that Learning Designs are pedagogically informed learning activities which make effective use of appropriate tools and resources.

Nowadays, academic staff in every level of education need to transform their teaching practices to support more future-orientated, digital, student-centered learning. For the promotion and implementation of such changes acceptable, meaningful, and effective staff development is required. The *Carpe Diem* learning design workshop process illustrates a viable constructive alternative to traditional staff development processes.

It is a new way of creating fast, effective, and innovative learning design using a team-based learning design process. '*Carpe Diem'* in Latin means '*Seize the Day*'.

Since the year 2000, the Carpe Diem method and variations based on its principles have been deployed across the world to enable collaborative ways of designing learning. The methodology supports effective collaboration between faculty, professional staff, and other stakeholders for rethinking the learning procedure. Carpe Diem is based on the original research of Prof Gilly Salmon at the Universities of Glasgow Caledonian, Bournemouth and Anglia Ruskin. It was developed further at the Universities of Leicester, Southern Queensland, Northampton, Swinburne and Western Australia.

5.2 Definitions, basic concepts, and principals

The Carpe Diem process is a collaborative, team-based, often online learning design process, created through research since the year 2000, and embedded in pedagogical research. It was originally conceived for two main purposes: *to help faculty at a campus-based university* (Caledonian University in Glasgow, UK) *introduce and deploy a brand new Learning Management System/Virtual Learning Environment (LMS/VLE)* and to *move from a single academic taking responsibility for a unit, module, course or program, to a team approach*.

The original Carpe Diem design came from creative processes, agile development, storyboarding and the new research on the 5-stage model. The process is delivered with a two-day workshop,

where "*every moment of time during the workshop would be spent* on designing something that could be put into immediate use with participants".

Carpe Diem design workshop was initiated to deploy agile project development for innovation, deploying pedagogical processes and productively incorporating new technologies. The collaborative processes engage academic, professional staff and many other stakeholders in new, supportive and more acceptable ways, providing them with a vehicle to work together. The team approach is resulting in better professional relationships after the intervention.

There are two types of Carpe Diem methods:

- one offering '*programme design*', for whole degrees through future visioning, threshold concepts and authentic assessment.
- one tackles '*module or unit design*' including detailed storyboarding and prototyping of online activities.

Both are suitable for the redesign of courses (from campus to blend or online), the introduction of more constructive deployment of learning technology and new developments. Both deploy the key Carpe Diem principles. The key Carpe Diem principles are:

- Scaffolding and student-centeredness;
- Cross-professional and disciplinary collaboration, development and feedback;
- '*Start with the end in mind*' - future visions and missions, then creating a design brief for student outcomes and explicit value for students;
- Visual and systems thinking, including storyboarding for pedagogical processes and curriculum structures
- Well researched evidence pedagogical processes including authentic assessment, threshold concepts and the 5-stage model, e-tivities and active online learning;
- Fast, agile and action based collaborative developments, including rapid prototyping.

5.3 How it works

Carpe Diem differs from traditional staff development approaches as it focuses on the learning design needs for specific units or modules or programs of study, thus producing a more authentic and relevant experience for those taking part. The deliverables by the Carpe Diem workshop can be used by the course team immediately. Participants become more skilled in the process of addressing a learning design challenge that the technology may help them to resolve.

Learning technologists and subject librarians offer additional input and support throughout the intervention, providing further opportunity for sharing of knowledge, attitude changes, personal and professional development.

Participants in Carpe Diem are guided through a design and rapid prototyping process by an experienced facilitator. They are constantly invited to think differently, to incorporate technology into their learning design. The ideology of the Carpe Diem process is that at the end of two days, they have their unit or module at least partly built in the online environment, with an action plan to support it.

The Carpe Diem facilitator's main role is to ensure that the workshop deliverables address the pedagogical challenges identified by the course team and draw on appropriate input from all participants. The role of the facilitator is one of the most important in the process. A passionate facilitator provides the participants with opportunity to pilot their course design aspirations.

Carpe Diem workshops not only put educators in touch with a future learning support, but also have the potential to develop a community of innovators and pioneers within their faculties and institutions.

Carpe Diem has proven suitable for the design of brand-new courses, works well for re-designs, and for transforming face-to-face, campus-based courses into online or blended modes of delivery. It has been used for mobile learning, entirely digital and blended learning. It is necessary to ensure that the learning outcomes and objectives are agreed upon before Carpe Diem starts.

5.4 Carpe Diem - for Modules: Process

The Carpe Diem process consists of six steps as depicted in Figure 6. Below are these steps as advice to teachers based on 'Carpe Diem Learning Design: Preparation & Workshop. *Carpe Diem Planning Process – Handbook*' that has been published for others to adopt through a Creative Commons License (source: https://www.gillysalmon.com/carpe-diem.html)

1. Write a blueprint – envision the future:

   Here you work together in your Carpe Diem pods to lay out the essential aspects of what you aim to achieve. Your output will be an agreed mission statement

2. Make a storyboard – become a designer:

   Here you draw out the process of your learning, teaching and assessment in a visual way, working out your schedule, a sense of flow and alignment between the components. Use the 5-stage model as a rough scaffold and your calendar for the delivery of the learning to participants to help you plan. It's your plan for transformation and impact.

3. Build your prototype online:

   Now you try out your design in the online environment and create some real practical testable e-tivities.

4. Check reality:

Your designs are tried out by your colleagues as 'reality checkers', to give you productive feedback. Let them have a go and then listen carefully to their feedback. Try not to be too defensive. You will be doing the same for others.

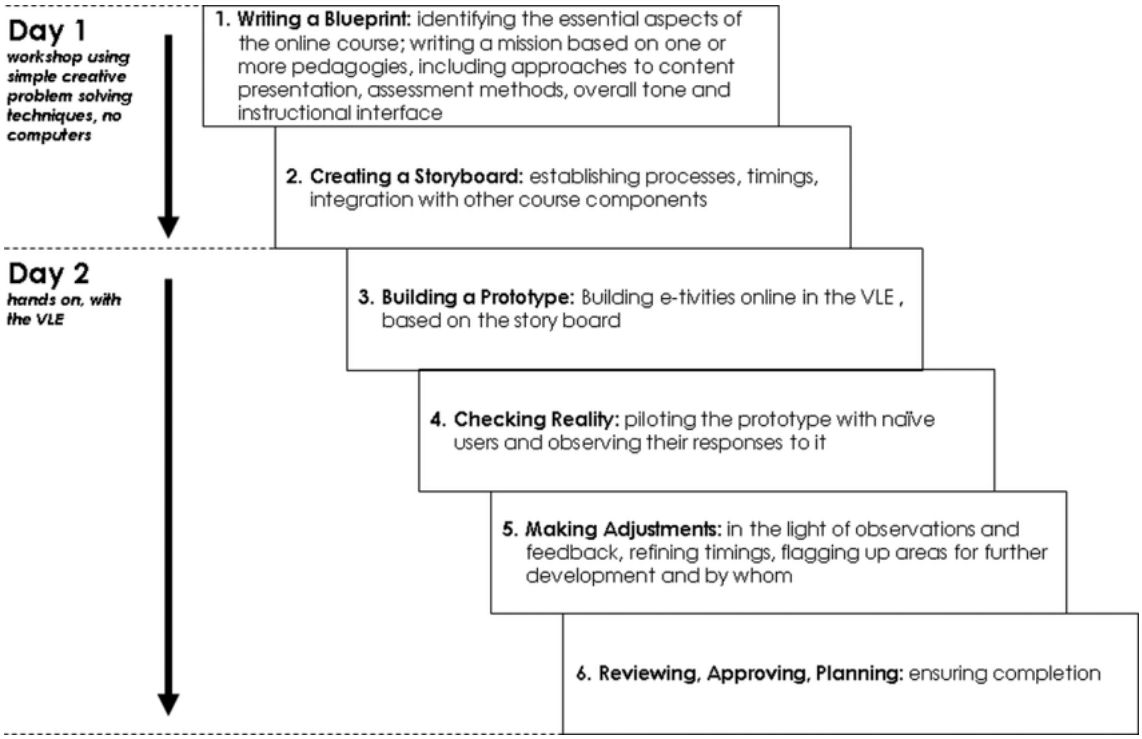
5. Review and adjust:

Preview the work so far, make adjustments, refine timings, flag up places to return to, indicate what additional work is needed and who should be responsible for it. You are ready to do the action plan when you can see a way from the storyboard and prototypes to an operational design vision of your online or blended course.

6. Planning your next steps:

Now the team is ready to build an action plan together.

Figure 6: The CARPE DIEM workshop model



Source: Salmon, G., Jones, S., Armellini, A. (2008). Building institutional capability in e-learning design. ALT-J, Research in Learning Technology. Vol. 16 (2), pp 95–109.

5.5 Carpe Diem as a New Style Staff Development

Basic characteristics of the model that makes it a New Style Staff Development are:

Attitudes and Readiness to Change

Changing educators' beliefs about pedagogical approaches impacts on their potential for innovating in their practice. Change in an individual's experience may then provide a pathway to influencing others, in their discipline or institution. Therefore, opportunities that target awareness and design strategies have the potential to provide more effective, scalable and sustainable educational transformation. Carpe Diem offers a promise to teachers to achieve an online or blended course in exchange for two days of concentrated effort, with support from a team of colleagues.

Authentic Development

Nearly all teachers wish to develop their practice in a way that directly and immediately can be put into use. Their preference is for learning which will develop their teaching in a meaningful, authentic and useful way. Developing staff is best achieved by focusing on their needs, by supporting, by active engagement and by creating knowledge that can be immediately usable in each participant's teaching context.

Time and Cost-Effectiveness

There needs to be an appropriate balance between investment in and output from the initiative. A high degree of personalization and flexibility is required to meet multiple disciplines and specific contexts. Carpe Diem is a model and framework well structured but not context specific and hence can be deployed in any discipline. It need not be presented as training and development but as a supportive way of academic staff designing and preparing their module.

Multi-Professional Teams

The productive and creative design and development of learning with technology requires educators to be multi-talented, or to unbundle faculty roles and responsibilities to gain expert input in online course development, both of which present serious challenges to institutions. Institutions are beginning to capitalize on the benefits of academic staff teams to help design online learning and teaching resources.

6. Managing RPL Assessments and Portfolios

6.1 Introduction

In the absence of recognized qualifications, many people face disadvantages in getting decent jobs, migrating to other regions and accessing further education, even though they might have the necessary knowledge and skills. The Recognition of Prior Learning (RPL) process helps these individuals acquire a formal qualification that matches their knowledge and skills, and contribute to improving their employability, mobility, education, lifelong learning, social inclusion, and self-esteem.

The Recognition of Prior Learning (RPL) is a process through which formal, non-formal and informal learning are measured, mediated for recognition across different contexts and certified according to requirements for access, inclusion, credit, or advancement in formal education or/and employment.

Formal, non-formal and informal learning that is under consideration for RPL includes previous studies - both formal (eg, school) and informal (eg, community education, workplace training courses), work experience – both paid and unpaid, life experience.

The methods used for RPL to assess formal, non-formal and informal learning vary across institutions, legal bodies, and authorities among different countries, but various portfolio processes appear to be prominent.

A portfolio is a method of collecting, organizing, and promoting the individual main achievements, whether they are trainees or employees. Nowadays, a common way to demonstrate RPL is to collect a portfolio of evidence to support claims against a variety of competencies.

6.2 RPL Assessments

Recognition of prior learning (RPL), prior learning assessment (PLA), or prior learning assessment and recognition (PLAR), is a process used by regulatory bodies, adult learning centers, career development practitioners, military organizations, human resources professionals, employers, training institutions, educational authorities of all levels of education, colleges and universities around the world to evaluate *knowledge* and *skills* acquired outside the classroom in order to recognize competences according to a given set of standards, competencies, or learning outcomes.

RPL is practiced in many countries for different purposes, such as a person's standing in a profession, trades qualifications, academic achievement, recruitment, performance management, career and succession planning.

- Challenges and goals of RPL according to UNESCO are:

- Quality of evaluation, reliability, objectivity
- Easy access from everyone
- Same procedures and standards in all countries to promote mobility
- Integration in formal curricula
- Participation of all interested groups
- Collaboration among employees, employers, educational institutions

6.3 What is recognition of prior learning?

The recognition in Recognition of Prior Learning (RPL) refers to the process by which a competent authority or education institution in one country assesses the knowledge, skills and competence that an individual possesses as a result of a period of:

- Learning acquired in a non-formal or informal setting;
- Learning that did not lead to a qualification;
- Learning acquired through professional experience;
- Learning acquired through unfinished studies at a recognized institution.
- Learning acquired through studies at a recognized institution of a foreign country with a quite different educational system.

Recognition of foreign qualifications may be used for different purposes, the most common being for access to further education and training (academic recognition) and/or the labour market (professional recognition).

Academic recognition focuses on recognition of periods of study or qualifications issued by an educational institution regarding a person wishing to continue or to begin studying or to use an academic title. It would be used for personal development and/or certification of current skills without progression into a learning programme or/and progression into a learning programme or/and to fast-track progression through the learning programme;

Professional recognition is an official authorization to practice a particular profession. It deals with the assessment of knowledge and skills of a specific person. The assessment of the required learning outcomes and competences related to a completed qualification may vary depending on the purpose of recognition. It would be used for labour market entrance or/and promotion or/and career or job change

Core Principles of RPL should be:

Learner-focussed

RPL should be a voluntary activity on the part of the learner. The learner's needs and reasons for recognition should be paramount.

Accessible

Accessibility can be facilitated through initial information and advice and manageable systems in terms of time and money from the perspective of both learner and learning provider

Flexible

A range of different approaches to RPL in terms of both support and assessment should be available to different sectors to support the diversity of learner needs, goals and experiences.

Reliability, transparency, validity & consistency

In managing RPL processes, these are necessary to ensure confidence in the outcomes.

Clarity of role definition

Staff involved in managing and supporting the RPL process should be provided with appropriate training and support.

Quality Assured

Moderation of RPL should be integrated within existing quality assurance processes and be available for scrutiny by appropriate external quality assurance, for example by an external auditing body.

6.4 The Benefits of RPL

Recognition of Prior Learning is useful to everyone including both employers and students. The benefits of RPL include:

- Facilitation of access for 'non-traditional' students – people who may not have had the opportunity to do further study
- Acknowledgment value of learning outside a formal setting
- Validation of the worth of learning students have achieved by themselves
- Support to students to progress to other education and training programmes
- Elimination of unnecessary repetition and duplication of material already familiar to the student
- Shorting the time necessary to earn a qualification – this motivates students who might otherwise be discouraged by the length of time required to
- Efficient identification of 'skills gaps' allowing for more focused training

6.5 Assessment Methodologies

The methods used for RPL to assess formal, non-formal and informal learning vary across institutions, legal bodies, and authorities among different countries.

Knowledge is often assessed by written or oral examination.

Performance of *skills* is frequently assessed by direct observation of the performance of the skills and procedures in the working environment, but for some skills such as emergency responses, simulations are often used.

Behavioural competence and *attitude* may be assessed by direct observation, inference from observation, formal examination or combinations to suit the circumstances.

Checklists are often used to ensure that standard procedures are carried out in the correct order and without omitting important steps.

It may be a requirement that the assessments are documented and recorded as evidence that they have been completed.

During the recent years methodologies using the evidences are preferred, such as *Portfolio of Evidence* and Third Party Reports.

Table 1 presents *Assessment Strategies* that should be under consideration from both candidates and evaluators:

Table 1. Appropriate Assessment Methodologies

Type	Example
Direct	- Observation - Demonstration - Simulations - Role Play
Indirect	- Work Samples - Workplace Documents - Third party reports (see below) - Projects - Portfolio of Evidence
Supplementary	- Questioning - Test - Oral presentation - Hypotheticals

Source: Ashwani Aggarwal. (2015). Recognition of prior learning: Key success factors and the building blocks of an effective system. International Labour Organization

6.6 Rules of Evidence

It is not enough just to collect the appropriate evidence. The way evidence should be collected is guided by rules of evidence, as shown in Table 2.

Table 2. Rules of evidence

Rule ***The evidence must be***	**The Evidence must:**
Valid	- Address the elements and performance criteria - Reflect the skills, knowledge and context described in the competency standard - Demonstrate the skills and knowledge are applied in real or simulated workplace situations
Current	- Demonstrate the candidate's current skills and knowledge - Comply with current standards
Sufficient	- Demonstrate competence over a period of time - Demonstrate competence that is able to be repeated - Comply with language, literacy and numeracy levels which match - those required by the work task (not beyond)
Authentic	- Be the work of the candidate - Be able to be verified as genuine

Source: Ashwani Aggarwal. (2015). Recognition of prior learning: Key success factors and the building blocks of an effective system. International Labour Organization

Furthermore, quality evidence should address the following:

- reflects the skills, knowledge and attributes defined in the relevant unit of competency
- shows application of the skills in the context described in the range statement in the unit of competency
- demonstrates competence over a period of time
- demonstrates repeatable competence
- is the work of the candidate
- can be verified
- demonstrates the candidate's current skills and knowledge
- does not require language, literacy and numeracy levels beyond those needed for the performance of the competency.

Nowadays, a common way for a candidate to demonstrate RPL is to collect a portfolio of evidence to support their claim against a variety of competencies.

6.7 Portfolios and Portfolios management

A portfolio is a method of collecting, organizing and promoting the individual main achievements, whether they are trainees or employees. The utilization of modern technological means has led to the digitization of traditional portfolios. Digital or electronic portfolios have been created.

The e-portfolio is a web-based information management system, which uses electronic means and services. Person develops and maintains a digital file of objects that he / she can use for demonstration of his abilities or for reflection on learning. They are collections of works that have been collected by a person, which are preserved and enriched by it, because the data included in this collection prove or certify the claims that the person can make about himself or his life. It is a collection of electronic evidence, collected and managed by a user, usually on the Internet. This proof can be text, electronic files, images, multimedia, blog posts, and links. It is a modern presentation of personal skills and a platform for personal expression, while if it is online it can be maintained dynamically. Some e-portfolio applications allow varying degrees of public accessibility and thus can be used for many purposes.

Features of E-Portfolios

- They consist of collections of information that they have a centralized structure
- They have a specific purpose of creation and constitute proof of the evolution of individual achievements and of the evolution of the individual's progress
- They are editable by specially designed software
- They have digital storage
- Operate online and interactively environment
- They are user friendly

Areas of Use of e-Portfolios

- Education
  - e-learning portfolios
  - Professional sector
- Student e-portfolios

What an e-portfolio should contain

Keeping in mind that an e-portfolio is used primarily in education sector it might include:

- Tasks
- Educational goals
- Projects, which have been implemented collaboratively

- Multimedia Files
- Evaluation Data
- Notes and diary
- Interviews with associates
- Discrimination
- Daily workflow
- Progress checks (in the case of education)
- Newspaper clippings
- Autobiography
- Adaptability and Maintenance
- Links to other electronic portfolios

e-Portfolio Systems:

- Commercial Software Systems: Angel Eportfolio Fronter, EPET RAPID, eXact, LiveText
- Open Source Software Systems: Elgg Learning Landscapes, Mahara, OSP
- Management systems with additional functions for e-Portfolio: Moodle with the Moofolio plug-in, Moodle with the Exabis Eportfolio plug-in
- Content Management Systems with functions Portfolio
- Software Systems, which are integrated: Winvision, Scioware-Concorde

6.8 Recognition of Prior Learning (RPL) Portfolio

As already has been mentioned above the methods used for RPL to assess formal, non-formal and informal learning vary across institutions, legal bodies, and authorities among different countries, but various portfolio processes appear to be prominent.

The e-portfolio as a digital file of objects that one can use for demonstration of his/her abilities is of practical use. E-portfolios offers a collection of electronic evidence, collected and managed by a user, in forms of text, electronic files, images, multimedia, blog posts, and links. Some e-portfolio applications allow varying degrees of public accessibility and thus can be used for many purposes.

During recent years many countries and authorities all over the world adopt the Prior Learning (RPL) Portfolio approach.

RPL portfolio advises

A typical RPL portfolio structure can be:

- Title page – including name

- Table of contents
- Personal information – including address, and contact information
- A cross-referenced to relevant employment, education, training, qualifications and learning activities
- Appendices (if relevant) – including copies of certificates and other evidence such as assessments or written feedback

Choosing what evidence to include

Each evidence should meet criteria as following:

- Current – no more than 5 years old or presented with further evidence that shows how you've kept up-to-date and built on your learning
- Authentic – your own work or own contribution
- Relevant – to the subject area of the course and linked to course or module learning outcomes

Reflecting on personal experience

It's essential that each learning experience included in your RPL portfolio contains evidence for what is learnt.

These questions identify and reflect on relevant learning experiences:

- What major events have you undertaken in your studies/experiences?
- What are your thoughts and feelings about these events, now and at the time you did them?
- What new skills have you developed because of these events? For example, have you changed your attitude? Would you act differently if the same situation arose again? Have you transferred this learning to other situations such as the workplace?
- What new learning has taken place because of the experience?
- What reading have you done? Which articles or books have you read that support your learning? What did you think of them?
- What personal changes have taken place because of your learning? For example, are you more confident?

Further RPL portfolio tips

- Give yourself enough time to complete your portfolio
- Don't assume the reader will understand the points you're making
- Make sure your portfolio reflects an academic approach at the level you're seeking credit for

Bibliography

Ashwani Aggarwal. (2015). *Recognition of prior learning: Key success factors and the building blocks of an effective system*. International Labour Organization. ISBN: 9789221296171

Andrade, H. & Du, Y. (2007). Student responses to criteria-referenced self-Assessment. Assessment and Evaluation in Higher Education, 32 (2), 159- 181

Armellini, A., Salmon, G. & Hawkridge, D. (2009) The Carpe Diem journey: designing for learning transformation. In: Mayes, T.,Morrison, D.,Mellar, H.,Bullen, P.& Oliver, M.(eds.) *Transforming Higher Education Through Technology-Enhanced Learning*. York, UK: Higher Education Academy. pp. 135-148.

Attard, A., Di Iorio, E., Geven, Santa, R. (2010).Student-Centred Learning - Toolkit for students, staff and higher education institutions. The European Students' Union. Brussels

Bayne, S. (2015). What's the matter with 'technology-enhanced learning'? Learning, Media and Technology, 40(1), 5–20. https://doi.org/10.1080/17439884.2014.915851.

Bennett, R. E. (2015). The changing nature of educational assessment. Review of Research in Education, 39(1), 370-407.

Benson, P. (2013). Learner autonomy. TESOL Quarterly, 47(4), 839-843. Doi:10.1002/tesq.134

Bugaj, T.J., Blohm, M., Schmid, C. et al. (2019). Peer-assisted learning (PAL): skills lab tutors' experiences and motivation. BMC Med Educ 19**,** 353 https://doi.org/10.1186/s12909-019-1760-2

Conrad, D. (2008). Building knowledge through portfolio learning in prior learning assessment and recognition. *The Quarterly Review of Distance Education*. 9(2), pp 139-150

Ehlers, U.-D. (2013). Open Learning Cultures. A Guide to Quality, Evaluation and Assessment of Future Learning.

Fuchs, D., Fuchs, L., & Burish, P. (2000). Peer-Assisted Learning Strategies: An Evidence-Based Practice to Promote Reading Achievement. Learning Disabilities Research and Practice, 15(2), 85-91.

Ioannou, A., & Artino, A. R. (2010). Learn More, Stress Less: Exploring the Benefits of Collaborative Assessment. College Student Journal, 44 (1), 189–199

Jacobs, G., Power, 2016Student Centered Learning – An Approach to Fostering Democracy in Schools.

Kadry, S., Safieddine, F. (2016). Cooperative Active Learning Methodology in Mathematics. Proceedings of EDULEARN16 Conference 4th-6th July 2016, Barcelona, Spain pp. 4039-4045

Kaput, K. (2018). Evidence for Student-Centered Learning. Education Evolving. Minnesota, USA. www.educationevolving.org

Kirkwood, A., & Price, L. (2014). Technology-enhanced learning and teaching in higher education: what is 'enhanced' and how do we know? A critical literature review. Learning, Media and Technology, 39(1), 6–36. https://doi.org/10.1080/17439884.2013.770404.

Kirschner, P. A. (2015). Do we need teachers as designers of technology enhanced learning? Instructional Science, 43(2), 309–322.

Lazarinis, F., Green, S., Pearson, E. (2010). Creating personalized assessments based on learner knowledge and objectives in a hypermedia Web testing application. Computers and Education, 55(4), 1732-1743.

O'Leary, M., Scully, D., Karakolidis, A., & Pitsia, V. (2018). The state-of-the-art in digital technology-based assessment. European Journal of Education, 53(2), 160-175.

Prince, M. J. and Felder, R. M. (2006). Inductive teaching and learning methods: Definitions, comparisons, and research bases. Journal of Engineering Education 95:123-137. DOI: 10.1002/j.2168-9830.2006.tb00884.x

Redecher, C. & Johannessen, O. (2013). Changing Assessment – Towards a New Assessment Paradigm Using ICT. European Journal of Education, 48(1):79-96.

Reinert, A., Vollmann, N., Heyder, M. and Krautschneider, W. New teaching approaches and student motivation lead to documented gains in engineering education. in Proc. IEEE Front. Educ. Conf., Madrid, Spain, 2014, pp. 1–4.

Salmon, G. (2020). Carpe Diem Learning Design: Preparation & Workshop. *Carpe Diem Planning Process – Handbook*. Available at: https://www.gillysalmon.com/uploads/5/0/1/3/50133443/carpe_diem_planning_process_workbook_webversion1june2020.pdf

Salmon,G., Armellini, A., Alexander, A., Korosec, M. (2019). Learning Design for Transformation. Progressing "CarpeDiem" from Example to Practice. *OEB19*.

Salmon, G., Van der Merwe, A. & Schoonwinkel, A. (2019) Carpe Diem for Educational Transformation. *World Conference on Online Learning*. November, Dublin.

Saye, J., & Brush, T. (2007). Using technology-enhanced learning environments to support problem-based historical inquiry in secondary school classrooms. Theory and Research in Social Education, 35(2), 196-230.

Shalem, Y., & Steinberg, C. (2002). Invisible criteria in a portfolio-based assessment of prior learning: A cat and mouse chase. *Pedagogy, Culture & Society, 10*, 425–448.

Sitthisak, O., Gilbert, L., Davis, H. (2008). An evaluation of pedagogically informed parameterised questions for self assessment. Learning, Media and Technology, 33(3), 235-248.

Thissen, D. and Mislevy, R. J., (2000). Testing Algorithms. In Wainer, H., ed. Computerized Adaptive Testing: A Primer. Lawrence Erlbaum Associates, Mahwah, NJ.

Topping, K. J. (2001). Peer Assisted Learning: A Practical Guide for Teachers. Brookline Books.USA. ISBN: 1571290850, 9781571290854

Topping, K. J. (2007): Trends in Peer Learning. In: Educational Psychology, 25 (6). Pp. 631-645.

Topping, K.J. and Ehly, S.W. (2001) Peer Assisted Learning: A Framework for Consultation. Journal of Educational and Psychological Consultation, 12, 113-132. http://dx.doi.org/10.1207/S1532768XJEPC1202_03

UNESCO Guidelines for the recognition, validation, and accreditation of informal learning. Available at: https://oerknowledgecloud.org/content/unesco-guidelines-recognition-validation-and-accreditation-outcomes-non-formal-and-informal-

Usher, J., MacNeill, S. & Creanor, L. (2018) Evolutions of Carpe Diem for learning design. *Compass: Journal of Learning &Teaching. 11*(1) 2044-0081.