Chapter 4: Digitalisation of Nursing and Nurse Education

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- Competence in digital pedagogy is a vital part of nurse educator competence due to changing healthcare and education environments.
- Community of Inquiry and DigCompEdu are frameworks for digital education that help educators to plan, implement and evaluate digital education.
- There are variety of digital platforms and mobile applications that can be utilised in nursing education given that the ethical, legal and accessibility are addressed in advance.

INTRODUCTION

Digitalization sets competence requirements for both nursing and teaching, hence, nurse educators need to master the digitalization of both fields. The specific competences required of educators in digitalization have been established on European level (European Commission [EC], 2021; Redecker, 2017). Educators need to be professionally engaged to utilize digital resources. Furthermore, they need to be competent in providing teaching and learning through digital environments and using digital teaching and learning resources and be well acquainted with digital assessment methods as well (Saaranen et al., 2021). Educators seek to facilitate their digital learning to empower the learners in digital competence (Redecker, 2017). However, digitalization in nursing, is a complex issue which requires attention already during nursing education.

Digitalization of nursing is the use of digital equipment, utilization of digital resources to support evidence- based practice, communication with patients and colleagues, providing e-health services, embracing nursing leadership and renewing the profession according to the new digital era (Booth et al., 2021). This therefore suggests that nurses need digital competence, to use and maintain the digital equipment as well as to operate them safely, ethically and purposefully in their work (Booth et al., 2021; Ryhtä et al., 2020). Furthermore, digitalization and especially automated processing of personal data sets higher demands on data protection, hence both nurses and nurse educators need to know, understand and be able to apply European and national data protection regulations and laws (Booth et al., 2021; General Data Protection Regulation [GDPR], 2016; Redecker, 2017). Nurses are key

professionals to introduce and use, as well as develop and implement, technological solutions for the users of any healthcare service system (Nes et al., 2021), ideally in collaboration with others (for example industry, IT-experts etc.). This creates an opportunity to implement services in new, efficient ways, and enables health care users to access the services in multiple ways.

The utilization of different digital technologies is common in higher education, including in nurse education (Tømte et al., 2019; Thrower et al., 2020). Digitalization manifests itself in two ways, in the nurse educator's competence requirements and pedagogical work. The extent of the digitalisation in the pedagogical work can be adjusted to some extent, but in this digitalised era, it is impossible to avoid it. Digitalisation affects the competence requirements of educators in all of the competence areas: subject competence, pedagogical competence, ethical competence, cultural competence, competence in interaction and collaboration, competence in leadership and management, competence in evidence based teaching, competence in sustainability and future orientation and continuous professional development (CPD) competences (Mikkonen et al., 2019). Nurse educators play an important part as role models and influence the skills of future nursing professionals (Alves et al., 2020, Nes et al., 2021).

In 2020, the world experienced a simultaneous shutdown of societies caused by the COVID-19 pandemic, despite this, preparedness for digitalization was evident in multiple societies. For example online services, such as e-health and digital health clinics, online teaching and learning at all levels of education, etc., enabled endeavour of multiple functions of the society, despite of the strict restrictions. Education (European Association of Distance Teaching Universities [EADTU], 2020) and health services were provided online or with minimum physical contact (Morin, 2020; Saeed & Masters, 2021). Digitalization may be a solution also to enhance accessibility of both health care and education, hence it may contribute to narrowing the health gap for example in rural areas with long distances or in different family situations. Accessing distance education or consultation with a health care professional may be more accessible, than being physically present for a single parent or person with limited abilities to be mobile. However, the assumption of digitalisation enhancing accessibility, has to be considered with caution, as there is a valid concern that most vulnerable people will gain least from the digital services due to insufficient digital competence or lack of infrastructure (Saeed & Masters, 2021). There is a risk, that people with inadequate resources may be overlooked in designing digital services, especially if the digital services replace the physical ones. (Saeed & Masters, 2021; Tomczyk et al., 2022.) Considering the risks and the benefits, there is a need to increase the digital competence of graduating nurses by developing competency-based curriculums including the use of technology (World Healt Organization [WHO], 2021). Here the input of educators becomes significant.

The requirements for nurse educator competence in digital pedagogy are multifaceted. In addition to the digital competence requirements of the nurses in relation to skills and competences needed in nursing, also pedagogy needs to be adjusted accordingly. Education that is intended for face to face delivery, cannot be directly transferred into a digital environment. Digital pedagogy is a concept that combines digital, pedagogical and ethical components (Ryhtä et al., 2020; Väätäjä & Ruokamo, 2021). Digital pedagogy includes, but is not limited to, virtual and online learning environments. In addition, teaching and learning materials have been transformed into digital formats. Furthermore, guidance of the students and evaluation take place partly online. (Alves et al., 2020; Ryhtä et al., 2020; Matsumoto-Royo & Ramírez-Montoya, 2021.) Furthermore, pedagogical approaches and educator competence in digital pedagogy must be developed. (Redecker, 2017; Thoma et al., 2019; Matsumoto-Royo & Ramírez-Montoya 2021; Hebert et al., 2022.)

Educators also play a key role in the development and preparation of future nursing curricula. The know-how of applying information and communication technology should be included in the study plans of nursing education organizations (Nes et al., 2021) and also in the educator education to enhance professional development (Kleib et al., 2022). Moreover, the work of a nurse educator can include applying for research funding or participating in digital competence development and research activities. (Rodriguez et al., 2022). The multifaceted role of educators' multiply the competence requirements. Educators must identify the necessary competences in digital pedagogy and manage the use of information and communication technology, so that they are able to teach future nursing professionals and further develop education to meet the needs of the future nurses and health care users. WHO has also pointed out that competence in digital pedagogy is one part of the competence needs of a nurse educator (WHO, 2016).

In this chapter, we refer to competence in digital pedagogy, as understanding of the potential of the digital resources, skills and competences required to utilize technological and digital resources and attitude to use the digital resources in nurse education (Ryhtä et al., 2020). In this chapter, the educator's competence in digital pedagogy is discussed in accordance with this second perspective, what kind of competencies the educators need in their work as nurse educators. In addition, the chapter reviews a few examples of methods suitable for digital pedagogy and resources from the Empowering Learning Environments in Nursing Education (ELENE) study unit as well as the use of digital resources by educator candidates of health sciences during teaching practice. Nurse educators need knowledge and skills to use digital technology and digital pedagogical solutions in their teaching. The ELENE study unit has been developed to enhance and promote educators' competence in digital pedagogy. The course is intended for both educator candidates and educators as continuing professional education.

EDUCATORS' COMPETENCE IN DIGITAL PEDAGOGY

Nurse educators' general competence in Europe is high (Vauhkonen et al., 2023; Elonen et al., 2023; Salminen et al., 2021). There are fewer studies about nurse educators' competence in digital pedagogy. However, a recent study shows that nurse educators' competence and utilization of digital resources is high, meaning the nurse educators utilize a great variety of digital resources frequently (Pajari et al., 2022). However, there are differences in the use of digital resources and competence of educators (Pajari et al., 2022; Ryhtä et al., 2021).

Concepts

There are several different concepts that describe the knowledge related to the ability to use technology in nursing and education, and these are also used in parallel (Spante et al., 2018.) Competence in digital pedagogy (From, 2017; Hauck et al., 2020; Ryhtä et al., 2020, 2021) and digital competence (Redecker, 2017) are sometimes used interchangeably, even digital competence may be understood to mean merely the digital competences without pedagogical aspect. Hence, for clarity, in this chapter we are using competence in digital pedagogy of nurse educators to describe the comprehensive phenomena of educators' competence combining the digital and pedagogical competences (Väätäjä & Ruokamo, 2021). Competence in digital pedagogy refers to the skill of using digital technology for teaching and learning, finding research information and training students to be users of digital technology (WHO, 2016). Competence in digital pedagogy consists of three components; pedagogical competence, digital competence and ethical competence (Ryhtä et al., 2020).

As a concept, digital competence is still evolving and it is used to refer to skills and competencies needed for utilization of technological and digital resources (Ilomäki et al., 2016). There is great variety of terms used interchangeably with digital competence, however, the breadth and width of the content within the concept vary as well. Digital competence is used interchangeably with for example ICT-skills, digital literacy, media literacy, new literacies and multiliteracy, even these terms are either narrower or broader concepts, than digital competence. (Ilomäki et al., 2016.)–Furthermore, the terms computer literacy, computer competence, nursing informatics and eHealth literacy have been used to describe digital competence within nursing (Nes et al., 2021).

Appropriate utilization of digitalization requires pedagogical competence from the educator. Pedagogical competence can be described according to the competence model of social, healthcare and rehabilitation educators (Mikkonen et al., 2019, pp. 81–86 in English). Pedagogical competence refers to educators knowing how to plan, implement, evaluate and renew education. This includes development of competence-based curricula. Pedagogical competence also includes that the educators know how to teach and guide students' learning using pedagogically justified teaching methods and learning environments. (Mikkonen et al., 2019.) Teaching in digital environments, for example online, and the use of

digital resources require all of this pedagogical expertise. In addition, when utilizing digital resources, the following are highlighted; planning, learner-centeredness and variation of methods.

Digital resources in this chapter refer to all digital technologies, platforms and applications that can be used for evidence- based education, collaboration and networking professionally (Redecker, 2017).

SUPPORT FROM THE FRAMEWORKS FOR DIGITAL EDUCATION

There are different frameworks or models to support digital pedagogy. What these have in common is that they all describe how educators can integrate technology into their work in different activities. (McGarr & McDonagh, 2019; Cabero-Almenara et al., 2020; Pajari et al., 2022). The frameworks can be practical guides on what nurse educators need to master (Redecker, 2017) and what they need to take into consideration (Garrison et al., 1999; Redecker, 2017) to provide a high quality digital education.

Framework for digital competence of educators – The European Framework for the Digital Competence of Educators

The European Framework for the Digital Competence of Educators (DigCompEdu) provides detailed description on different competence areas in digital pedagogy. The framework is originally developed for primary and secondary education, but due to its generalizability it can be used as a framework for higher and professional education as well (Caena & Redecker, 2019; Cabero-Almenara et al., 2020). The competence descriptions in this framework can be used as a guideline for the critical issues within digital pedagogy that the educators have to take into consideration in their work and their own professional development (Redecker, 2017). Furthermore, DigCompEdu offers standards to plan and implement educators training to utilize digital resources (Caena & Redecker, 2019). (Figure 1.)

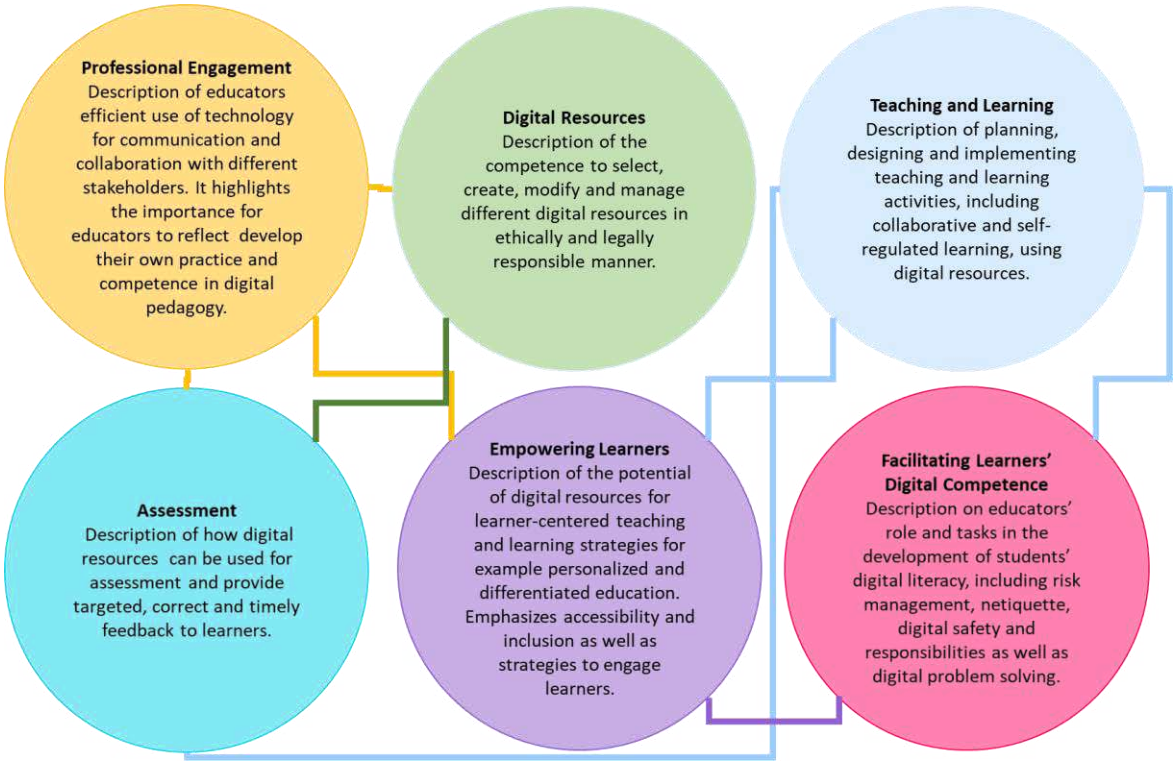

Figure 1: Competence areas of DigCompEdu (Redecker, 2017; Caena & Redecker, 2019.)

Framework for collaborative online learning – Community of Inquiry

The Community of Inquiry (COI) model states that educators and learners form a community that actively learns in collaboration with each other through the three core presences: teaching presence, social presence and cognitive presence. The actual learning experience happens in the center of the three presences. (Garrison et al., 1999). This model is based on social constructivism (Kozan & Caskurlu, 2018) and intended initially for digital text-based learning, but it has evolved and expanded alongside with the expansion of the digital teaching and learning resources. COI model can be utilized as a framework for digital education utilising a variety of teaching and learning methods and different digital resources. (Garrison, 2007; Garrison et al., 1999; Micsky & Foels, 2019.)

The model describes and guides educators on how to create the different presences. Teaching presence is achieved through planning and organising, facilitating communication and guiding the students in both practical and theoretical issues (Akyol & Garrison, 2019). Educators need to create instructions, goals, evaluation criteria and learning tasks that are clear and visible to the students and enable and facilitate collaborative learning. Similarly as DigCompEdu (Redecker, 2017), COI also emphasizes dividing the study unit into smaller, easily digestible portions, using multiple varying teaching and learning methods, and helping the students to focus on the essentials. (Akyol & Garrison, 2019; Boston et al., 2009; Shelton & Hayne, 2017).

Social presence is achieved through open communication, group cohesion and personalisation (Akyol & Garrison, 2019). Educators can promote social presence with enabling collaborative learning through group assignments and other activities, that help promoting trusting communication and group formation. It is critical to enable and facilitate the discourse in a manner that supports mutual respect and enables learning, creating a safe learning environment for students to share their own thoughts and ideas. (Akyol & Garrison, 2019; Micsky & Foels, 2019; Shelton & Hayne, 2017.)

Cognitive presence is formed, when the students and the educators form a joint understanding of the topic at hand. Collaboration within community, inquiring learning and reflection create cognitive presence. (Akyol et al., 2009; Akyol & Garrison, 2019; Garrison et al., 1999.) Cognitive presence is created with initiating triggering event that induct inquiry. Through inquiry, with the support from the group and the facilitators, the information is integrated, which leads to the resolution, mutual understanding of the topic. (Akyol & Garrison, 2019; Garrison et al., 1999; Micsky & Foels, 2019.) (Figure 2.)

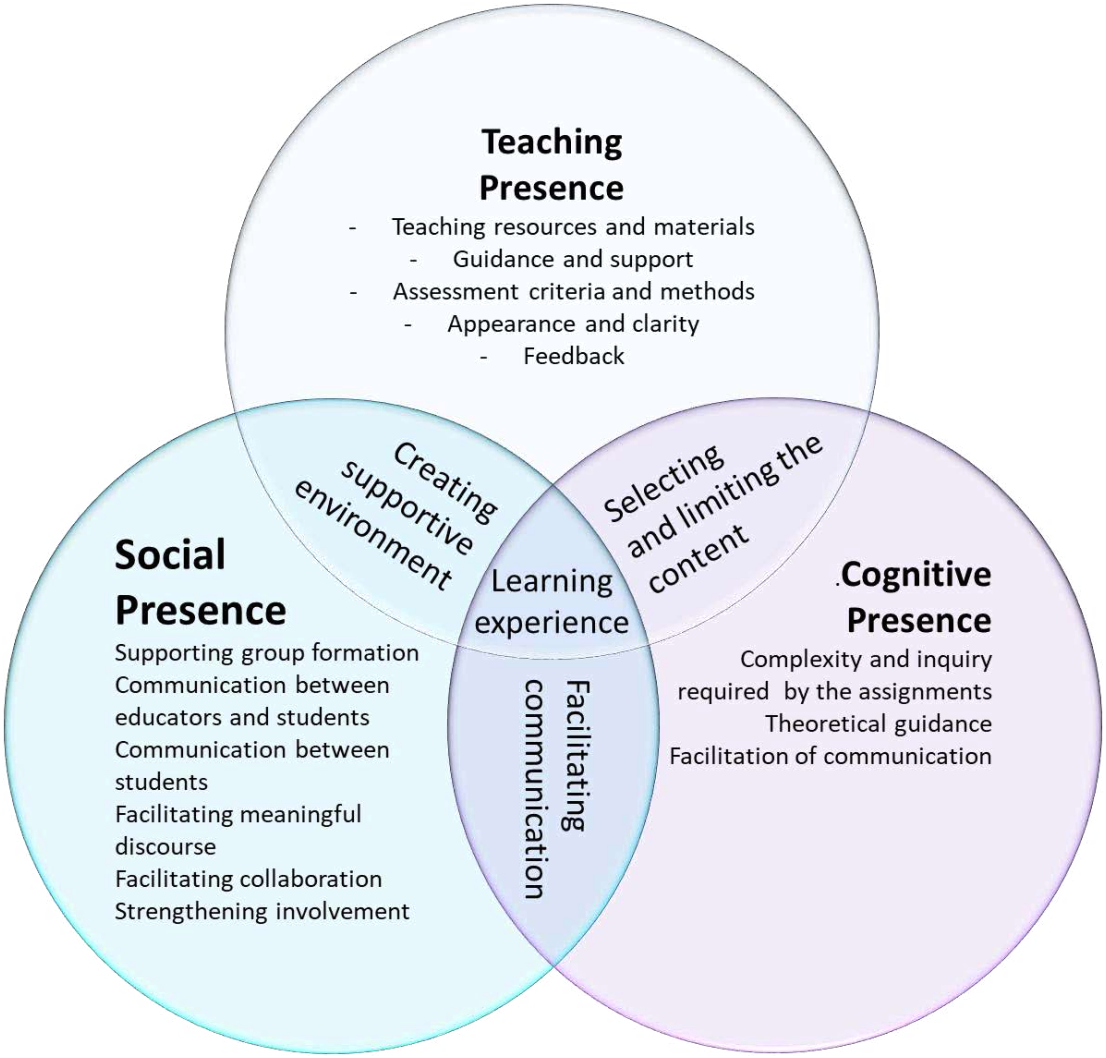

Figure 2. The presences of Community of Inquiry modified from the original. (Garrison et al., 1999). CC BY-NC-SA 2.0

DIGITIZATION IN THE WORK OF A NURSE EDUCATOR

The use of digital resources is one possibility to offer new ways of interaction, assessment and participation (Thoma et al., 2019; Thrower et al., 2020.) The digitalization in healthcare operating environments and education has increased (Webb et al., 2017; Thoma et al., 2019; Kalanlar 2022) and they are suitable for modern teaching alongside with traditional teaching (Webb et al., 2017). Various digital interventions have been used in higher education and the outcomes of the interventions have been mainly positive (Sormunen et al., 2022). For example, in nursing education, the experiences of using social media (Salminen et al,. 2016) or virtual reality (Chen et al., 2020) have been inspiring. But there are also challenges associated with their use (Chen et al., 2020; Nes et al., 2021). The challenges related to digital resources, such as accessibility of digital resources, functionality of technology and internet connections or possible students cognitive load, should be considered. The linearity of teaching from learning goals to assessment with pedagogical planning should also be consider (Nes et al., 2021; Orr et al., 2022). Therefore, the benefits of digital resources for teaching and learning must be assessed (Figure 1). Teaching online may require a different kind of presence and commitment from the educator than traditional classroom teaching. For example, online teaching highlights the student's active role and self-initiative. For educator, supporting social interaction can be more challenging online than face-to-face, so these need to be carefully planned. (Pramila-Savukoski et al., 2023.)

Empowering learning environments in nursing education (ELENE) – Evidence-based digital education

ELENE started in 2013 (Salminen et al., 2016) and has been further developed and updated over the years of its delivery. The learning goals of the study unit focus on deep understanding of digital learning environments, utilizing social media and digital applications in education and utilizing different digital pedagogical solutions in teaching and learning. Moreover, the aim has been to learn to use collaborative teaching and learning methods in nursing education and networking (Papastavrou et al., 2016), hence adapting community of inquiry and DigCompEdu as the frameworks for the study unit was a natural choice.

ELENE is a hybrid study unit, consisting of both distance and face-to-face learning. The study unit consist of online independent studying, group work, webinars and five days intensive learning. In the webinars the students return a written assignment of the certain topics, e.g., podcasts, 3D-technologies and robotics used in nursing education and present their topic as an oral presentation during the online webinar. The aim of the task is to understand and describe how these digital resources can be used in nursing education. The students are required to describe the use and learning possibilities of the resources and critically appraise their advantages and disadvantages from the perspective of educators, students and learning environment. The intensive week consists of guided group work, lectures,

workshops, excursions and a final seminar. In the beginning of the week, students are divided into new groups and they prepare a short teaching and learning activity utilizing a given social media or digital resource, such as thinglink, canva, podcast etc. which they present in the final seminar. (Figure 3.) The idea of the course is learning by doing, testing and discussing, and learning from each other.

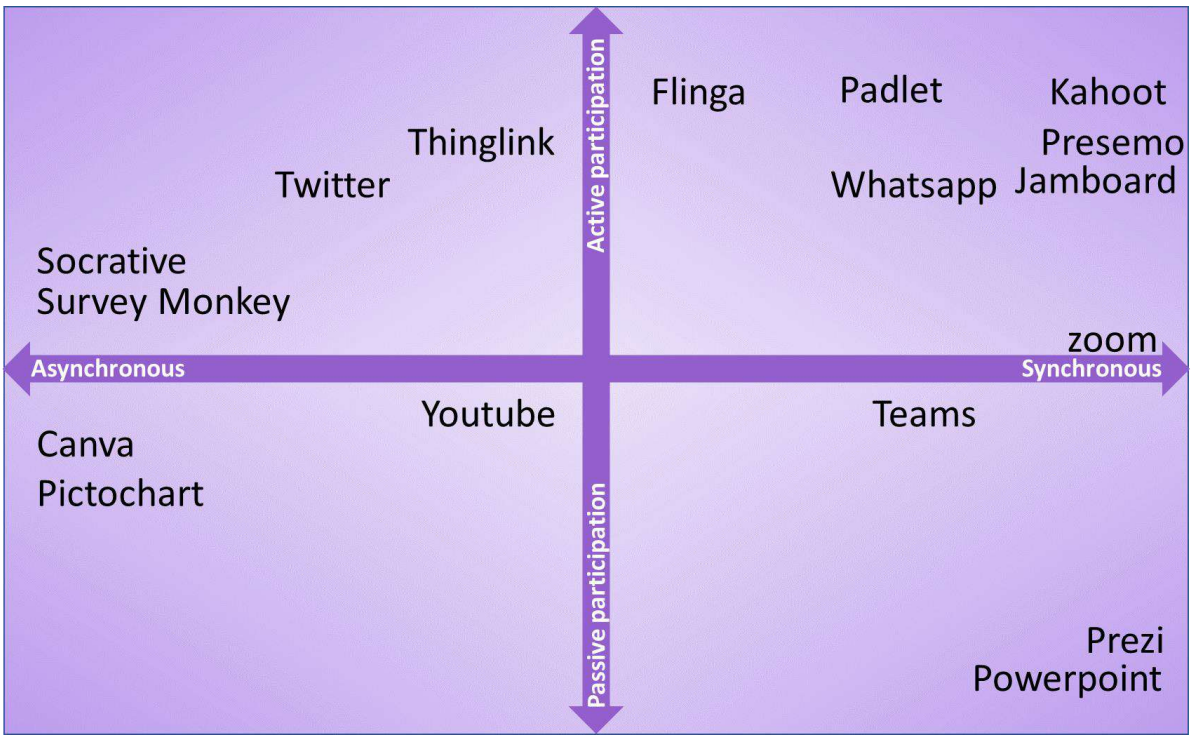

Figure 3. Chart of some examples of different digital applications and social media platforms divided according to their usability characteristics.

The planning and organisation of the study unit, plays an important role in achieving teaching presence in any study unit (Akyol & Garrison, 2019). ELENE has been delivered over a decade, yet to keep up with the constantly evolving and expanding digital landscape, the planning of the next study unit starts immediately after the feedback from the previous one. The instructions for the assignment are revised and renewed where necessary, to assure clear and visually engaging learning materials (Akyol & Garrison, 2019; Shelton & Hayne, 2017). Furthermore, in all written information, both visual elements and layout are conducted in a manner, that supports inclusion and accessibility of the learners (Redecker, 2017). The goals, guidelines and assessment criteria and methods are available for the students before the study unit starts, on the front-page of the learning environment (Shelton & Hayne, 2017). All students receive personalized information and instructions on how to access the learning environment and what is expected of them during the study unit prior starting the studies (Redecker, 2017.)

During ELENE open communication is both encouraged and required, as many of the assignments are conducted as collaborative group projects (Akyol & Garrison, 2019; Shelton & Hayne, 2017). Students have the option for online mentoring and individual support, should they need it (Redecker, 2017; Akyol & Garrison, 2019). Furthermore, to strengthen the pedagogical presence, the last two implementations have been conducted with voluntary group guidance, additional online and onsite mentoring, which received very positive feedback from students, as it eased scheduling and technical issues affecting accessibility and inclusion (Redecker, 2017). Educators have guided the group work both through written and oral instructions both online and face-to-face, and offering time and space for guided collaborative work both during webinar preparations and the intensive learning week, hence facilitating group formation, constructive communication and a safe space (Akyol & Garrison, 2019; Garrison et al, 1999; Micsky & Foels, 2019; Boston et al., 2009; Shelton & Hayne, 2017)

ELENE assignments require inquiry and scientific approaches (systematic information search, critical appraisal, synthetization and both oral and written reporting), as well as communication, collaboration, and leadership and management within the learning groups (Akyol & Garrison, 2019; Shelton and Hayne, 2017). There are multiple different learning assignments and methods used during the study unit, to motivate and engage the students and to enable a multifaceted learning experience aiming for deep understanding of the topic and the learning is divided into smaller units, to help the students construct knowledge and understanding (Redecker, 2017; Akyol & Garrison, 2019). Through ELENE we illustrate encouraging deep understanding and constructing knowledge through variety of approaches, summarized in figure 4.

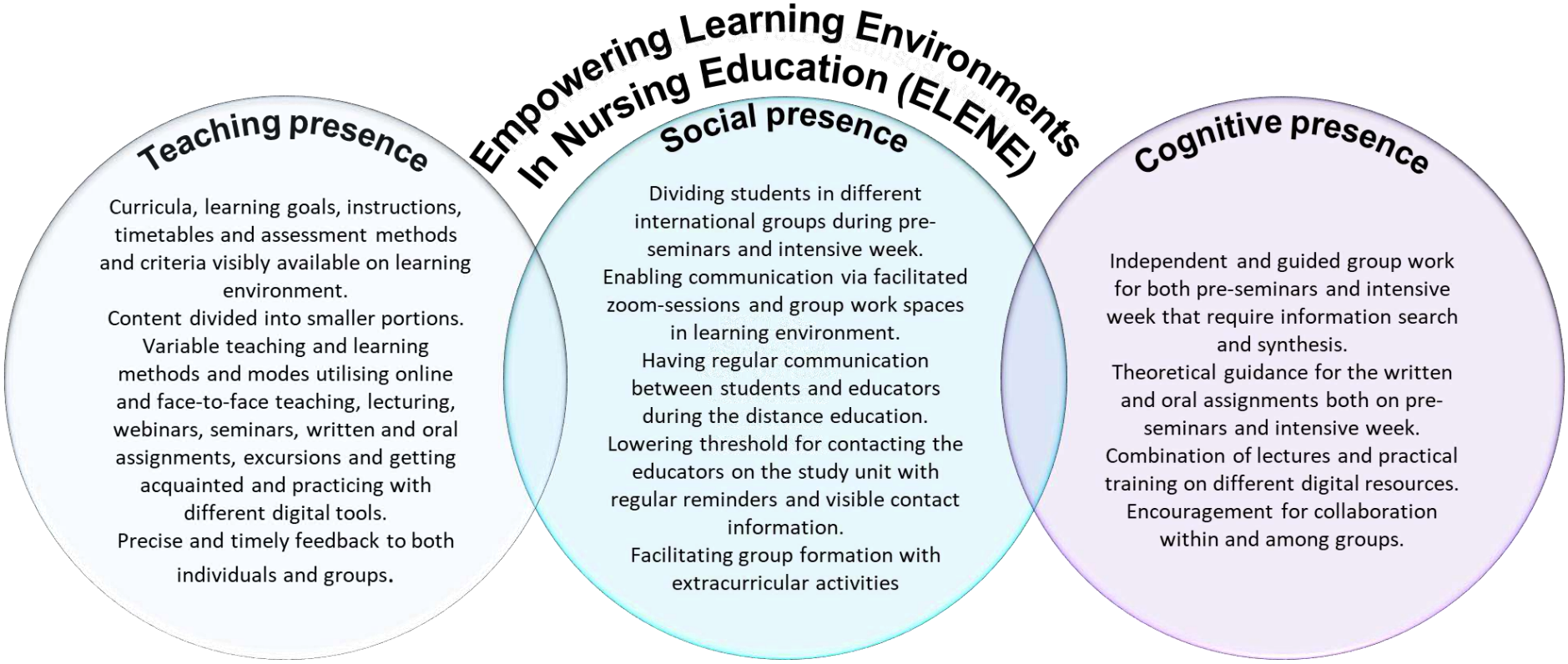

Figure 4: Teaching, social and cognitive presence on ELENE

DIGITAL PEDAGOGY AND THE CONTINUING EDUCATION NEEDS OF NURSE EDUCATORS

Digital pedagogy is multifaceted concept and the educators' competences in digital pedagogy vary considerably. There are several issues that have been linked with the educators' competence in digital pedagogy, such as educators' personal traits, possibilities for collaboration, available technological resources, organization's policies regarding digital pedagogy and CPD (Elonen et al., 2022). Educators' interest to utilise digital technology and competence in digital pedagogy can be enhanced with the continuous education of educators (Elonen et al., 2022; Ryhtä et al., 2021). The continuous education opportunities need to be timely, of high quality and purposeful continuous education that benefit both the educators and the organisations they represent (Elonen et al., 2022). In addition to continuous education, professional development can be achieved by being actively involved in projects, collaboration and self-directed learning (Koskimäki et al., 2021). Re-skilling and upskilling through education, have been named also in the European Declaration on Digital Rights and Principles for the Digital Decade, that is European Union's engagement to assure safe and sustainable digitalisation of Europe (European Comission [EC], 2022). CPD is not only and obligation but a right of educators (EC, 2022; Smith et al., 2023).

All educators need competence in digital pedagogy. However, the level and number of competencies required from all the nurse educators need to be justifiable. Can we and should we require all educators to have multiple competencies in digital pedagogy, or should we instead, promote collegiality, where educators would be prompted and encouraged to collaborate more and share their expertise and competencies within their work community? Instead of team-based learning, should we move towards team-based teaching? Teaching in teams frees all the educators to utilise their strengths while learning from each other's competencies simultaneously (Meizlish & Anderson, 2018). Furthermore, where the competence requirements of the educators (WHO, 2016) are fundamental, the sheer number and depth of competencies that are required from nurse educators today (Smith et al., 2023), with the digitalisation of society, nursing and education, makes it impossible for everyone master everything, hence collaborative teaching, may be the only way to go.

CONCLUSIONS

Digital competence of the nurse educator describes the ways, how an educator is able to use digital technology and digital environments in their teaching. Competence in digital pedagogy combines digital and pedagogical competence and is a requirement for the purposeful utilisation of technology in teaching and learning (From, 2017). Digitization has introduced modern and flexible opportunities to be implemented in nursing education. This has also resulted in new competence requirements that must be identified to organize education for the continuing professional development for nurse educators. Therefore, there is a need for research on pedagogical approaches to utilize digital resources so that higher

learning goals and deeper learning can be achieved, including problem solving and critical thinking competence (Nes et al., 2021; Orr et al., 2022).

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