SUPPLEMENTARY OPEN AND DISTANCE EDUCATION FOR IMPRISONED ADULTS

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Abstract:
The adoption and implementation of distance education in the prison school context implies new roles for teachers, formal and non-formal learners and educational materials, while enhancing openness as an integral feature of a distance education environment. This study – through a participatory action research – seeks to explore how teachers have applied e-inclusion to enable inclusive online teaching/learning strategies, emphasizing the interaction of digital tool learners and teachers. Needs emerged that helped to clearly show the necessity of face-to-face teaching but also the existence of complementary distance education to prevent the digital divide from increasing the difficulties of students with special educational needs, in relation to the possibilities of distance education in prison schools. The investigation of the educational needs of institutionalised adults from their own perspective was defined as the basis for the creation of appropriate and effective educational material. The novelty of the material lies in the fact that it presents information in a way of active involvement of the trainees in the learning process. In the design of the multimodal educational material, the purpose and expected results were used, so that the trainee could evaluate their progress on their own. Our aim was for learners to be able to improve their knowledge across the whole range of teaching contents by developing cognitive and social skills.

Keywords: education of institutionalised adults, Open and Distance Education, educational materials, educational applications

1. Introduction

The aim of the paper is to examine the ways in which teachers have applied e-inclusion to adults who are incarcerated through face-to-face and complementary distance education in order to ensure the right of these people to education, thus enhancing the

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open character that it should have in the modern era. In order to serve the purpose, the paper is structured as follows: in the second (2nd) section, a literature review is carried out regarding the role of the teacher in distance education, openness and the inclusion of vulnerable social groups in education. In the third (3rd) section, the methodology applied, the sample, the research process, the materials and the main findings are presented. The fourth (4th) section discusses the major findings of the research are reported, while in the fifth (5th) section, the main conclusions are presented. Finally, in the sixth (6th) section, a proposal for possible future research is made.

2. Literature review

2.1 The educator's role in distance education

The role of the school has changed, and complementary distance education has been developed internationally, aiming to enrich students' knowledge and support the school (Murphy & Rodríguez-Manzanares, 2009). The teacher's role in distance education is to act as a mentor and guide, maintain frequent communication with students, assess their work and encourage them to continue their studies and acquire skills (Murphy & Rodríguez-Manzanares, 2009). The teacher's collaboration with students also plays an important role in organizing and keeping the timetable (Kounatidou & Mavroidis, 2024). A challenging role is that of e-inclusion involving the teachers' ability to increase student participation and improve learning processes. Computers, software and modern technology are already being used in the classroom to contribute to effective communication and education (Manousou & Lionarakis, 2013). In the new environment of Distance Education, the teacher plays a different pedagogical role compared to face-to-face education. Basically, there should be a shift of focus from teaching to advising their students in order to enable them to develop meaningful interaction with the educational material through specially designed activities (Murphy & Rodríguez-Manzanares, 2009).

The difficulty is identified in the students' logistical infrastructure deficiencies. The research findings so far are consistent with the characteristics of other studies (Zhang *et al.*, 2020; Xia, 2020) and can contribute to improving the condition of e-learning. At the same time, however, important issues, such as the necessity of the human-centered dimension of distance education, are raised (Abidah, 2020) with a focus on issues of equal access (Reich *et al.*, 2020). According to Camacho *et al.* (2020), the new role of teachers is highlighted, as they are required to make, in terms of flexibility and accessibility, all the necessary changes, adaptations in means, techniques and methods, in order for learners to gain positive learning experiences in the context of Distance Education. Teachers need time, resources, training and technical and logistical support to adapt their practices to the needs of Distance Education (Zhao *et al.*, 2020).

Teaching must provide learners with learning activities and rich learning opportunities to enable students to cultivate skills such as creative thinking, clear communication, effective collaboration, efficient cooperation, systematic analysis,

iterative-progressive planning, group collaboration and lifelong learning skills, which are considered essential (Biasutti, Antonini Philippe & Schiavio, 2021).

The benefits of Distance Education are related to ensuring the sustainability of education (Akinbadewa & Sofowora, 2020), providing lifelong learning (Alharthi, 2020) and reducing costs (Al-Husban, 2020) if the learner and the teacher are in different places. Its limitations are related to methods, timing and time (Albalawi, 2018; Weinhandl *et al.*, 2020).

2.2 Openness in education

Equity in education is a benchmark in modern times. The 21st century brings rapid changes at all levels, accompanied by new opportunities and demands, and changes the way people live, work, communicate and learn (Ossiannilsson, 2018). Education is not only a vector of information and skill cultivation but also "*teaches people how to learn*", and how to create knowledge themselves, which in turn will lead to progress and development at all levels (Lionarakis, 2006; Ossiannilsson, 2018).

Nowadays, it is not only about equity, but also about openness. According to Article 26 of the Universal Declaration of Human Rights (United Nations, 1948) and UNESCO (2015, as cited in Ossiannilsson, 2018), education should be accessible to all, anytime, anywhere and through any device, promote respect between people and nations, and ensure the participation of all participants. The above statements indicate all the changes that need to be made to education in order to make it open to all and to meet the challenges of modern societies. The existence of openness in education implies restructured educational systems that promote democracy, Human Rights and equality in all its forms and under all circumstances (Lionarakis, 2008).

Openness in education first emerged as a term in the 20th century and has since then been constantly adapted according to the circumstances (Peter & Deimann, 2013). It is a philosophy, culture and policy and its interpretation is fluid, creating difficulty in adopting a clear definition (Baker, 2017). More specifically, the difficulty in defining openness is due to the fact that it both influences and is influenced by social, economic, political and educational factors (Peter & Deimann, 2013). Thus, circumstances such as those arising from the financial crisis in 2008-2009 or the pandemic in 2020, which relate to all of the aforementioned factors, shape openness and, in turn, openness reshapes the environment in which it exists (Jones, 2015).

An initial approach to the philosophy of openness was Lord Crowther's statement on the occasion of the founding of the Open University, regarding the openness of the institution in terms of ideas, people, place and methods, thus laying the foundations of Open Education (Villanejor-Mendoza, 2013). From this statement, some parameters that frame the theory of openness in (mainly university) education emerge and relate to flexible curricula, free access to higher education, the use of Open Educational Resources (OER) and innovation in terms of teaching methods and educational materials (Villanejor-Mendoza, 2013). An extension of the above interpretive approach to openness in education is the definition of openness by the Education Resources Information Center (ERIC), where it is noted that openness is related to student autonomy, the supportive

role of teachers, flexibility in terms of time, place, pace and choice of educational materials, all centred on students' right to have a choice regarding their education (Jones, 2015). These parameters are partially adopted and implemented by Open Universities worldwide, in line with the social, political and economic needs that these institutions address (Jones, 2015; Wiley, 2006). By implementing and adopting the policy of openness, educational programmes are characterised by democratic ideas and provide students with equal educational opportunities and the possibility to function autonomously and equally with each other and with teachers (Baker, 2017; Cronin, 2017; Villanejor-Mendoza, 2013; Wiley, 2006).

However, the existence of openness is usually explored in the context of higher education (Villanejor-Mendoza, 2013). Opening up schooling, which is generally considered closed, is an even more complex and slow process, as schools, while certainly influenced by the socio-economic, political and educational context at the time, respond more slowly to change (Baker, 2017). At the same time, the lack of a concrete definition of openness and its fluid interpretation does not allow for its integration into a directly applicable pedagogical framework and, in particular, into a school setting (Baker, 2017; Kounatidou, Sakkoula, & Lionarakis, 2023).

If we try to concretize and define the concept of openness in school education, we can interpret open school as an educational model that recognizes the fundamental right of all students to quality education (Kounatidou *et al.*, 2023; Sakkoula, 2021, 2022; United Nations, 1948). In other words, open school treats all children equally and makes sure that their needs are met, without making any segregation or excluding any part of them because of their origin, economic and/or physical status or performance (Abrioux & Fereira as cited in Torres, 2013). Moreover, the student is at the centre of the learning process and has the possibility to propose changes, make choices and partly determine their school life (Kounatidou *et al.*, 2023; Mohammed & Mishra, 2012).

At a practical level, the open school, taking into account the socio-economic and political conditions, as well as the specific characteristics of its students, can choose some of the aforementioned criteria of openness, adapt them and, through appropriate practices, implement them. For example, it could possibly create individualised teaching programmes to support students with different backgrounds or with special educational needs and disabilities (Sakkoula, 2022). In addition, it could involve students in making important decisions without reducing the weight of their own voice compared to that of teachers, enhancing their responsibility and participation in processes related to education and their daily life at school (Liyoshi & Kumar, 2010; Weller, 2014). Finally, it could provide a degree of flexibility and freedom in terms of time and pace of learning for students, taking into account their learning profile and the fact that not everyone can learn at the same speed (Liyoshi & Kumar, 2010; Weller, 2014). Thus, learners' autonomy and participation will be enhanced, and stress will be reduced (Liyoshi & Kumar, 2010; Weller, 2014).

Overall, the adoption of openness and the implementation of similar practices in the school environment link learning to the cultivation of skills necessary for the later life of students in modern societies, such as autonomy, acceptance of diversity and

collaborations (Lionarakis, 2006; Liyoshi & Kumar, 2010). Of course, as already mentioned, such radical changes are difficult to implement, especially in the school environment (Baker, 2017). Leaders, whether principals or teachers, have to take into account the legal framework and/or other constraints and choose those practices that best suit themselves, their students and the school in question. Even the partial implementation of openness potentially leads to the creation of a more democratic school, with the corresponding social implications and effects on students' later adult life (Lionarakis, 2006, 2008; Liyoshi & Kumar, 2010; Weller, 2014).

2.3 Open-inclusive education and e-inclusion of vulnerable social groups

As already mentioned, openness or open education is about ensuring the right to education for all students and in fact, it is an umbrella term that covers all existing approaches towards the democratization of education (Peter & Deimann, 2013; Sakkoula & Lionarakis, 2024). Ensuring the participation of socially vulnerable groups - in this case, the imprisoned - in the educational process is, of course, of major importance.

In order to speak in more concrete terms, and referring mainly to the practical and less to the theoretical background, we will refer to the inclusion and integration of the imprisoned, through the use of technological tools that fall within both face-to-face and distance education. Inclusion refers to the equal and fair treatment of disadvantaged students by teachers, enhancing interactions both between teachers and students and among the student body, adopting inclusive practices by teachers, and ensuring a climate of acceptance and cooperation among students in an educational environment (Majoko, 2017).

Inclusive education is approached in the academic literature from positions that, in some cases, are so general, overarching all over the place, absolutist, emotional and arbitrary that they do not allow for its realization. We live in the age of inclusion, where it is presented as the complete paradigm and the only morally desirable possibility (Mc Menamin, 2017). There is no doubt that inclusion, as an educational ideal, is complex, and there is often an apparent tension between texts that support it and practices that are resistant to it (Evans & Lunt, 2010).

Parmigiani, Benigno, Giusto, Silvaggio and Sperandio (2020) report the results of their study focusing on e-inclusion, which is seen as the ability of teachers to increase the participation of students with special educational needs (such as specific learning difficulties and difficulties associated with social, cultural or economic disadvantages) and disabilities and to improve their learning processes through the use of multiple devices and applications. This research sought to explore how teachers applied e-inclusion in the prison school context to enable inclusive online teaching/learning strategies, with an emphasis on the interaction between digital tools, contexts, students and teachers to prevent the digital divide from increasing the difficulties of students with special educational needs (Selwyn & Facer, 2007). Information Communication Technologies (ICT) help students in various ways by monitoring what is happening in the classroom, making them feel that they are an integral part of the classroom activity (Lombaert *et al.*, 2006), reducing their sense of loneliness and isolation (Zhu & Van

Winkel, 2014), lowering anxiety (Anderson & Rourke, 2005) and maintaining social relationships with their peers (Jones & McDougall, 2010). They can extend teaching/learning processes beyond the classroom through online activities, transcending the boundaries of space and time (Wadley *et al.*, 2014). The emerging environment of Distance Education in the context of the prison school holds new roles for teachers, formal and non-formal learners, as well as the educational materials.

3. Methodology, materials and results

The research method used was Participatory Action Research. This is a qualitative research method as it offers teachers the opportunity to combine their teaching and research skills, turning their teaching space into a field of inquiry (Carson, 1990) through a reflective and critical approach to their work (Hadfield, 2012).

In the practice of action research, participants explore their own teaching practices with the direct aim of developing their practical judgement as individuals. Thus, it can be a step towards liberatory action research, in which participants take responsibility for their own role in assisting the group in the collaborative activity (Carr and Kemmis, 1986).

Group interviews with the students were recorded, and notes were taken by the researcher. The interview managed to serve three objectives. First, it could be used as a primary means of collecting information directly relevant to the research items. Understanding, on the one hand, what the learner thinks enables the researcher to understand a person's knowledge (knowledge or information), what a person likes or dislikes (values and preferences) and what the person thinks (attitudes and beliefs) (Tuckman, 1972). Secondly, the interview was used to test hypotheses and in the form of the research instrument to identify variables and relationships. Thirdly, its use was possible in conjunction with other methods of conducting the research. In line with Kerlinger (1970), it can be used to monitor unexpected results, or to evaluate other methods, or to examine more deeply the motivations of respondents and why they responded as they did.

Specifically in our research, we used the semi-structured interview format in which predetermined topics to be discussed and the main body of questions that adult prisoners would be asked to answer were included. However, where necessary, there was flexibility in the precise wording of the questions. The interview guide, depending on the situation and the interviewees' responses, was subject to adaptation with additional or other clarifying questions and comments. During the interview, the researcher also took field notes with the interviewee's permission. In the interview process, the researcher's detachment was followed in order not to take the interview as a friendly transaction and to avoid the possibility of calculated responses (Cohen & Manion, 2007). Interview participants were made aware of the developmental process and their exposure, with informed consent and voluntary participation, with a detailed explanation in advance of the benefits associated with their participation in the research process (Frankfort-Nachmias & Nachmias, 1992).

3.1 Educational process

Following a specific set of conditions, the blended learning model (Image 1) was chosen to guide our processes, created to measure the needs of the specific situation in the context of the imprisoned learners. Through preliminary discussions and negotiations among the participants we arrived at specific questions by identifying causal factors or proposing alternative ways of approaching them. Based on the sequence of specific stages, the sample and, in particular, the specific number of learners of the Second (2nd) Chance School of Larissa, Greece, was determined, as well as the choice of materials and methods of teaching and learning.
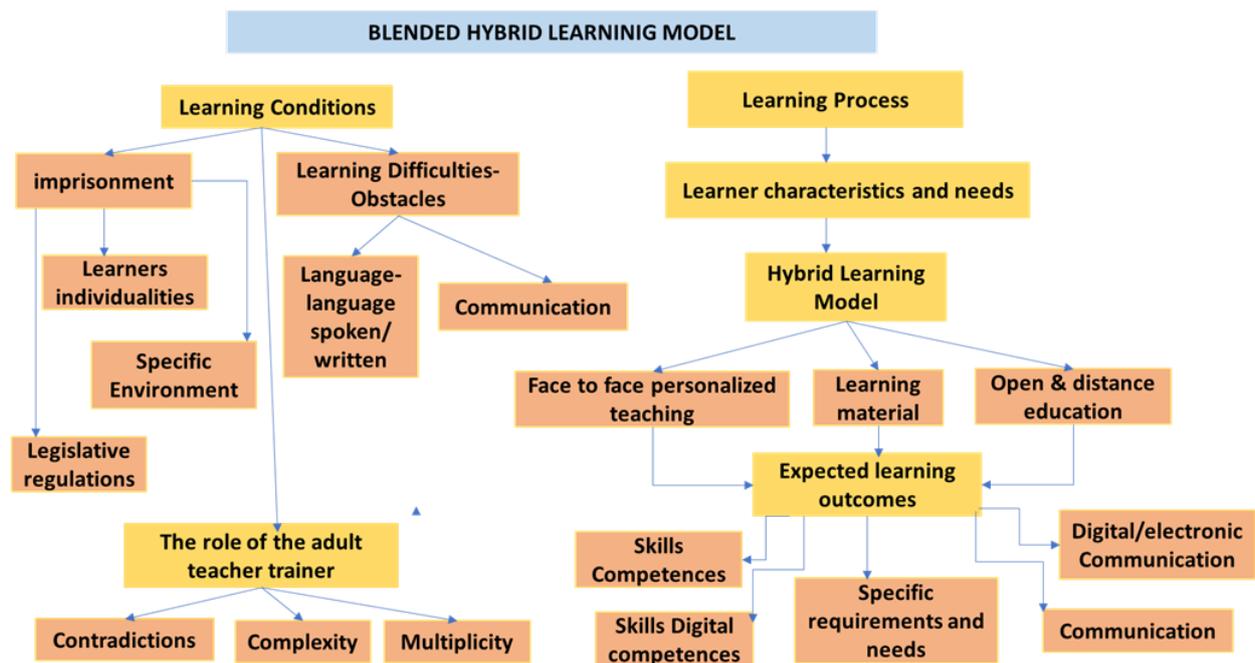

Image 1: Blended learning model for incarcerated adults

During the implementation of the project, data collection was selected at different time intervals. Working groups were designed to sensitize the learners as to their attitudes and expectations. Different types of observation (participatory and non-participatory), diary studies and other relevant documents were used as part of the case study. This enabled us to use a wide range of research methods and techniques (McKernan, 1996).

3.3 The teaching intervention in the Second Chance High School of the city of Larissa
3.3.1 Sample selection – Participants – Duration of the survey

The case study consisted of the learners of the Greek language programme who were selected by sampling. The prison of Larissa and, in particular, the Second Chance School of Larissa was chosen as the place for the selection of the sample-participants because of its central location and easy access. Gaining access to the research site is one of the most important challenges in the research process, especially when studying sensitive and special populations, such as prisoners (Labaree, 2002). Also, four (4) imprisoned adult

undergraduate students of the Hellenic Open University who were attending distance education courses after receiving scholarships participated. The survey was conducted during the period 2019-2022. In particular, thirty-two (32) adult imprisoned learners participated in the survey.

During one teaching hour in the classroom (40 minutes), with the first part of the 16 learners, the teacher-researcher implemented an activity to familiarise them with the operation of the educational application. More precisely, the learners first navigated through the digital course environment and the individual sections of the course were read (knowledge path). Then, the students were shown how to study the educational material remotely and complete the individual activities in the educational application. Next, the learning objectives were presented, and the diagnostic test was completed. The distance learning course was equivalent to 3 instructional hours, and students were given a three (3) week grace period as they would have to be on-site to complete the course. After this time, ten (10) minutes were allotted in the next face-to-face class for students to complete the final assessment test.

The following tools were used to investigate the learning outcomes: (a) diagnostic test (pre-tests), to test any prior knowledge of the students and (b) final assessment test, to check the learning outcomes after the completion of the teaching intervention. Both the diagnostic test and the final assessment test included closed and open-type exercises of graduated difficulty. The final assessment test included two additional open-ended questions where students could freely write down what they liked or found difficult during the teaching intervention. In addition, (c) a short questionnaire with open-ended questions was used, to capture students' attitudes before and after the teaching intervention.

The use of different data collection sources and techniques within all three phases of the evaluation of the teaching material was chosen in order to ensure the reliability and validity of the research process (Creswell, 2011; Cohen, Manion & Morrison, 2018). Specifically, during the survey, respondents mentioned the need for access to an electronic system, electronic learning management with technological resources and more effective mentoring support from teachers.

3.3.2 The educational application of digital material

Educational material is used in various forms, such as print, digital text, audiovisual and interactive media, in order to ensure access to the subject matter, supporting different ways of learning and allowing learners to learn at their own pace and according to their own needs (Clark & Mayer, 2016; Simonson, Smaldino & Zvacek, 2019). Following the theoretical principles of distance education, the design of educational materials emphasised features such as structure, format, style, content and teaching aids in order to serve the distance learning process in terms of quality and effectiveness (Holmberg, 1988; Perraton, 1988; Peters, 1988; Moore, 1994). These characteristics have been constant parameters of "Learning Design" (Colone, 2010, 2013) for the production of educational content of all forms (print, digital and multimedia), serving the pedagogical, student-

centred, flexible and innovative dimension of learning in distance learning environments (OU, 2023).

The creation of the digital material was organized with collaborative activities of the learners, utilizing skills according to their needs, with social interaction between themselves and with the educational material. The concept of Guided Didactic Conversation is fundamental in distance education and in the characteristics that digital educational material should have (Koutzeklidou & Lionarakis, 2023).

The educational material called "ZITO" (REQUEST) is the result of many years of experience in teaching Greek language programmes to adult learners who were incarcerated in a detention centre (prison). The specificity of the manual lies in the fact that it was based on the needs of the inmate's daily communication with internal and external administrative structures and institutions. Thus, the title "ZITO" was chosen. The applications, dialogues and generally the written and oral production of the educational material refer to real situations, which were suggested by the learners themselves during the months of cooperation with them, thus providing them with additional motivation to learn the Greek language that was "new" to them. When the inmates themselves asked for this material, the significance given was great, so that they could use it according to their needs (Mayer, 2020).

3.3.3 Analysis of digital educational material

The specific forms used as templates for written communication with institutions involve requests of all kinds, such as authorisation and official statements. The main objective was to familiarise the students with the communicative and linguistic practices related to public documents, which require the completion of specific details of the enrollees. The goal was to understand and effectively use genres of authentic texts encountered in the inmates' interactions with prison services.

In the educational application hosted on a tablet and on a computer, there are the following sections:

1) Social service: for understanding and effective use of texts regularly used in prisoners' communication with the social service and for participation in programs, activities, benefits and permits.
2) Secretariat: for the understanding and effective use of texts relating to the completion of applications, certificates, certificates of conduct and other documents handled by this service.
3) Financial services: to familiarize learners with concepts and procedures related to their financial needs and transactions.
4) Institutional organs: to familiarize trainees with practices relating to verbal communication between inmates and administrative bodies or persons who make decisions about their fate while incarcerated.
5) Justice services: to understand and effectively use texts relating to legal issues and court cases.
6) Health services: to understand and make effective use of texts relating to the provision of health and psychological support services.

7) Education: for familiarity with language and communication practices related to issues of incarcerated adults in the context of prison education, identified in this section. In particular, the aim is to understand and effectively use the texts used in applications for inmates to join educational units, inside or outside prison.

The differentiation of the modules followed the separation of the structures and services within the detention facilities that are recipients of different requests from inmate students. The activities of the modules foster the cognitive and communication skills of the participants, while the existence of dialogues develops oral and written language. The discussion results from the dialogues with the trainees and develops new linguistic and communicative elements (Arvanitakis & Arvanitaki, 2000, 2006; Spyrtou and Andreou, n.d.; Okay-guide to Multilingual Support, 2016).

Following Holmberg's (1988) guided didactic discussion, which is one of the most basic teaching approaches in distance education, the learner can better understand a text when it is framed in an interactive format. The principle of multimedia is used, as there is a combination of visual and verbal content at the same time (Mayer, 2014). The dynamics of images are combined with words, following multimedia learning, which is the construction of knowledge using multimedia, the combination of words, images and sound (Mayer, 2020). Furthermore, "the principle of adaptability" or (formatting) is applied, and new information is presented with "picture" and narrative rather than "picture" and text (a combination of visual information) (Mayer, 2020).

The specificity of the way information is presented enables the learner to take an active role as a user, ensuring the learning advantage of interactivity. In this conversion, the use of voice (the voice principle) was chosen because learners learn better when the words in a multimedia message are spoken in a pleasant and attractive human voice rather than in a mechanical one Mayer (2020). The creation of the voice-overs for the modules was done using the researcher's human voice. The measure to protect the training application due to the prison context is the non-permanent storage of information by the learner to learn through repetition. The novelty of the educational digital material lies in the fact that it presents the information in the way of active involvement of the learners in the learning process, as it was created according to their real needs and works as an educational application called ZITO (REQUEST) on a PC or a mobile device, without the necessary use of the internet according to the limitations of the closed environment of the prison.

3.4 Reports of prisoners

"I lack someone to explain what I need. To understand the subject, I need to do it myself. I don't have anyone to tell me how this or that is. When I read, I think I'm reading. It's not always easy, because I'm in a dormitory with eight inmates."

"When I'm alone, I don't address anyone. When I'm with inmates, I ask for help..."

"We don't have internet, we don't have access, we are imprisoned, but we have rights and needs even with restrictions and control."

We know that interactive technologies, above all, have highlighted, in distance education, what should be at the core of any educational process: the interaction between all those involved in the process (Moran *et al.*, 2013).

The involvement of learners in the project did not come without difficulties and obstacles in particular:

- The prisoners of different ages and levels of education and interests.
- The different ethnicities and communication problems due to the language and educational needs of the incarcerated adults
- The low learning level of prisoners and the existence of high literacy rates.
- The operation of different sections of trainees in each ward of the prison.
- The teaching of more general education courses to inmates without a parallel link to labour market needs.
- The existence of many movements of prisoners and the composition of the classes that constantly change during the year.

3.5 The learning material

The concept of Educational Material (EM) in all forms and levels of education is very general and not defined by a strict definition, because educational material can be considered as any material utilized in the educational process in order to help or guide someone to learn (Holmberg, 1988; Reigeluth 1997; Winn, 1997).

The identification of the characteristics of educational materials in distance education starts from the basic principle that they ought to motivate and facilitate learners in their learning (Keegan, 1996), creating, according to Holmberg, (1960, 1995), a guided dialogue that contributes to the active learning path (Rahman, 2006), which is the main objective in this form of education. In full agreement with Rowntree (1994), once the learner comes into contact with the educational material or educational 'package', they should feel that they have a 'teacher' at their service ready to help them. Race's (1989) empowerment thesis was also a key pursuit, arguing that the design of open learning materials should be based on the 'will, action, feedback, assimilation' model, which is necessary to have such features that will encourage learners in a process of continuous improvement and motivation.

3.6 Principles and design of the learning material

The term "design and creation principles" or "framework of principles" is chosen to be used in combination with or as an alternative to the term "model", which designers choose to use. It is necessary to emphasise that all model templates are considered by many theorists (Reigeluth, 1997; Winn, 1997) to be unsafe, as human behaviour and the learning process are often unpredictable and there is no guarantee that something that was successful once will always be as successful. Furthermore, the learning process is impossible to represent through an automated model template. The design and creation

of educational material in distance education is one of the most important issues, as it is the main driver of the educational process (Lionarakis, 2001; Rahman, 2006).

The West and Lionarakis categorization model was chosen in order to be used for the creation of the learning material The West and Lionarakis categorization model (Lionarakis, 2001) is a typology that deals with the structure, organization and learning design of the educational material. It is a classification of educational material based on constructivism and the qualitative criterion of polymorphism (Lionarakis, 2001; Rahman, 2006).

The process of transformation of the material was made taking into account that in Distance Education it is necessary to create a: live, two-way, accessible and friendly educational material, enriched with applications, activities and exercises that will stimulate the interest of the learner, activate him and help him to smoothly integrate into the learning process. Attention was paid during its creation to: a) the detailed presentation of what to do, why to do it, when to do it, how to do it and if it was done b) the choice of activities that promote the continuous and creative interaction of trainee teaching material, leading him/her to the effective acquisition of knowledge (Manousou & Lionarakis, 2013; Rahman, 2006).

The use of any tool should not be uncluttered, since it should provide learners not only with the presentation of the learning material but also engage them appropriately so that they can be productively involved. The variety of content, to the extent that it is characterized as multimodal and not the simple digital text-centric reproduction of the educational material, has the potential to enhance the conventional printed material and strengthen the whole educational process (Lionarakis, 2008; Fragaki & Lionarakis, 2011; Matzakos & Kalogiannakis, 2018).

During the development of the multimedia material, the principles proposed in the relevant literature regarding the presentation of multimedia information were applied (Mayer, 2020):

1) **The adaptability (or modality) principle.** The adaptability principle (the modality principle) refers to the greater effectiveness of information when it is presented in "pictures" accompanied by narration (spoken "words") than in "pictures" with text (written "words") (Clark & Mayer, 2016; Mayer, 2020; Oberfoell & Correia, 2016). Learning is more effective when one cognitive pathway is combined with another of a different type, such as auditory and visual. Thus, according to this principle, the presentation of new information was done- either through narration (acoustic processing) combined with "pictures" (visual processing), or by a single cognitive pathway, such as: "pictures" (visual processing only), or "narration" (acoustic processing only), or "written text" (visual processing only).

2) **The individualisation principle.** The individualisation principle suggests that people learn better when the "words" in new multimedia information are presented in simple daily and colloquial language, rather than in formal language (Clark & Mayer, 2016; Mayer *et al.*, 2004; Mayer, 2020; Rey & Steib, 2013). Students feel more at home when written or spoken language is addressed in a friendly manner. During the training process, the discourse followed the basic techniques

for creating a familiar type of conversation, and we used the first or second person (either singular or plural), activating the student's interest to understand the information, increasing cognitive effort to integrate into their existing experiences and prior knowledge.

3) **The voice principle.** The voice principle states that people learn better when the words in a multimedia message are spoken in a pleasant and engaging human voice rather than a mechanical one. The reason seems to be that the human voice is more indicative of an interlocutor rather than an unfamiliar one, like the mechanical voice, which pushes the learner to make more effort to understand the information (Mayer, 2020). For this reason, we used vocalizations that were able to influence the degree to which the incarcerated learner felt a sense of involvement, i.e., assistance in their effort.

4) **The productive activity principle.** The productive activity principle states that people learn best when, after being presented with verbal or multimedia information, they engage in creative learning activities, for example, planning, imagining, controlling, interpreting, teaching or role-taking (Mayer, 2020). Activities such as those mentioned above were used by engaging the learner in cognitive processes such as observation and then in selecting appropriate items (from the visual and verbal material). The teacher's implicit cue in prompting attention towards the main information was considered important, both in situations of passive learner participation and active participation, e.g. during manipulation of interactive multimedia (Mayer, 2020).

3.7 List of specific features

Based on the guidelines-directions-clarifications for the creation of educational materials for open education by Rowntree (1994), Race (1989) and Rahman (2006), a list of special features is formulated, which was also followed by the researcher for the creation of educational materials for incarcerated adults and can be summarized as follows:

- Clarity in defining the purpose, objectives, and expected outcomes in each module, enhancing the learners' "will" to engage with the educational material
- Emphasis on appropriate and sufficient visual material (images, photographs),
- Careful structuring of the content/material of the seven (7) modules into small flexible sub-modules, each with a beginning, middle and end,
- Support and signposting of the content with distinctive and explanatory titles-subtitles,
- Existence of different types of activities/exercises, accompanied by answers that help to provide feedback on the process, interaction and encouragement for learners,
- Design of the teaching material with emphasis on the aesthetic aspect using supporting colours,
- Content written in a friendly style, simply worded, coherent and clear,

- Emphasis on interaction and printed material in a variety of ways, such as activities, provision of space in the form of notes for learners to write their own ideas and interact with the material.

Kim & Bogale (2014) emphasize that learning design should include the use of ICT for the success of these programmes. According to Afifi & Alamri (2014), the shortcomings in the design of distance education programmes are mainly due to the absence of effective principles, especially the principles of pedagogy in relation to learning theories and models of design.

3.8 The educational application of digital materials

The 'forms' of educational material refer mainly to the type of material, printed and digital, but also to its appearance, elements which are some of the factors of its effectiveness. Although the means of information transfer facilitate the learning process (Rowntree, 1994), the most decisive factor in improving its effectiveness is the pedagogical design of the educational material, not the means of its transfer (Lionarakis, 2008).

Upon research, we identified that tablet-type electronic devices are now considered as a "universal" device due to their relatively cheap cost and high flexibility in use, compared to other categories of digital devices (Papadakis, Kalogiannakis & Zaranis, 2019; Papadakis & Kalogiannakis, 2020). Not surprisingly, applications related to the use of these devices that claim to provide students with educational experiences have similarly high growth rates (Godfrey & Reed, 2013; Papadakis & Kalogiannakis, 2017a, 2017b). With the right content and context, apps have the potential to positively transform learning, and the use of the interaction and personalization opportunities offered motivate students to invest more effort in learning tasks (Calder, 2015; Papadakis, Kalogiannakis, & Zaranis, 2017).

Thus, with the possibility of using a mobile device beyond the school computers, the creation of the educational material for the imprisoned adults was established by giving them the opportunity beyond the use of the computer screen in the school premises to be able to study the educational material remotely with the educational application on a tablet format device (Image 2) without the necessary use of the internet (Koutzeklidou & Lionarakis, 2023).
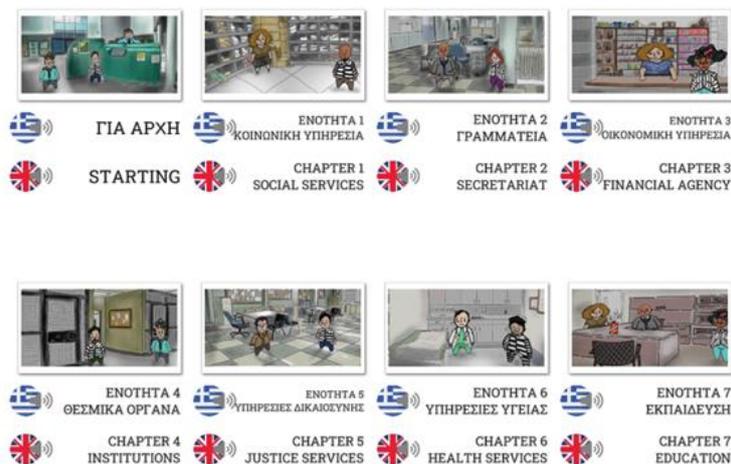
Image 2: Digital material presenting the set of educational
modules on the smart mobile device (tablet)

4. Discussion

As we are in the 21st century and there is an ongoing debate on equity and Human Rights, openness in education is a prerequisite and ensures the existence of democracy (Baker, 2017; Sakkoula & Lionarakis, 2024). Part and indicator of openness is the inclusion and participation of vulnerable social groups in the educational process, without barriers and restrictions (Baker, 2017).

One of these groups is imprisoned adult learners, who, however, refer to the difficult study conditions in prison. The existence of alternative ways of learning could be a solution, but the education and training process in penitentiary institutions has many shortcomings. Our findings agree with Lockitt (2011) with reference to insufficient interactive multimedia training materials, ineffective use of new technology and limited access to technology. Regarding the needs of incarcerated learners, shortages of appropriate print and digital educational materials are identified. Inmates request personal assistance from the instructor. They feel trust in the instructor and accept that distance learning in the learning process could help them. These findings are in line with Grammens *et al.* (2022), who highlight that the pedagogical dimension of distance education comes to complement, enrich, and strengthen the teaching and learning process rather than replace the learner-teacher relationship. The findings are in line with Papadimitriou and Lionarakis (2016) and the development of the pedagogical approach which implies new roles for teachers, learners and the educational material. Our findings agree with Anastasiadis (2020) because, in the emerging environment of distance education, the role of the teacher is to advise and support the learner in their effort to interact with the specially designed educational material which is at the heart of the learning process.

According to Kelenidou, Antoniou & Papadakis (2017), distance learning can be a main or complementary mode of education, in a particular learning environment, such as the prison school, with positive results on student performance compared to conventional education. The participants of the study, imprisoned learners, point out the

importance of communication with both the co-learners and the teacher/s, stating that it is quite satisfactory for most of them despite the difficulties they face. The findings of the survey are in line with Goleman (2011), as communication is the cornerstone of social skills by conveying persuasive messages in this challenging environment. The findings show the difficulties in verbal communication, writing, lack of time, and difficulty in communication-contact.

According to Costelloe and Warner (2014), difficulties are identified in the educational processes within detention facilities in many regions of Europe due to problems with timekeeping, as well as communication difficulties due to different nationalities of detainees. The education project within our research was positively received by prison staff members, which is in line with the research of Hammerschick (2016) and Puolakka (2021). The prisoners focused on the difficult conditions in the prison cell, the lack of quietness and infrastructure (reading room), and the lack of books and educational materials. The availability of alternative ways of education may be the proposed solution, such as using new technologies and acquiring digital skills. The findings are in line with Linardatou and Manousou (2015), since the main advantage of distance education seems to be the great capacity to adapt to any situation and, therefore, to that of the prisoners. Our results also agree with Bates (2016), as teachers and trainers become more familiar and confident with online learning. New technologies are becoming the most innovative methods that are constantly being developed. Furthermore, Novek (2019) focuses on developing alternative materials and different teaching styles for teachers to cope with the harsh conditions of prison. According to the findings of the study, the lack of space and accessibility in the library is identified, as well as the noises that distract learners from studying with the lack of access to digital materials. Similar results are supported by Atuase and Filson (2024) because the facilities and availability of library resources in the detention facility school do not meet the learning and research needs of detained students in distance education programmes. Also, in a similar report, (Lockitt, 2011), several problems and shortcomings are identified that define the education and training process in penitentiary institutions, such as ineffective use of new technology, inadequate interactive multimedia educational materials, limited access to technology and problems associated with the lack of interactive/continuous Skype/MSN support. The e-learning environment is not in itself suitable for teaching, but it can be seen as a framework of opportunities and possibilities that promote interaction, as this needs to be transformed by the teacher for the purposes of teaching (Kron & Sophos, 2007; Schelle *et al.,* 2010). In ensuring effectiveness in distance education, the communication between the instructor and learners plays a dominant role.

Learners who participate in online activities are likely to perform better in their studies (Davies & Graff, 2005; Sivapalan & Cregan, 2005; Smith, 2011; Smith, 2011; Armakolas, Mikroyannidis, Panagiotakopoulos & Panousopoulou, 2016). Technological skills are important in the distance learning process. Support and assistance from both the instructor and the administration of the educational institutions play an important role in the completion of this task (Ioakimidou and Lionarakis, 2017). Research results regarding the quality and completeness of the content of the educational material

(Niannouris & Kalogiannakis, 2019; Stavgiannoudakis and Kalogiannakis, 2019) suggest the incorporation of activities that the students themselves have created with free on-line tools, a suggestion that was also highlighted by the incarcerated adult learners themselves. The multimodal digital educational material created includes similar activities and favours all internal forms of dialogue, during the educational process, "dialectical", "adaptive", "interactive", and "reflective". The writing language is understandable and the style is familiar and friendly, so as to motivate the learner in learning. In the digital educational application, the use of Greek words and the existence of colours and sketches of the educational material create a climate of familiarity and the learner feels from the first moment that he/she is part of this digital "journey" to knowledge according to their needs. The material follows the principles of multimedia learning as developed by Mayer (2017).

The lack of a connection between the present and the pre-existing knowledge of the trainees and the non-active participation of the teacher in the form of a picture or sketch, in order to create an additional climate of intimacy and closeness with the learner are mentioned as weak points of the material. The combination of the two modes of teaching, namely distance and conventional, was suggested by the majority of the participants.

The structure of educational material in a digital distance education environment is an important factor for successful design because it motivates the learner's interest and influences the way they learn through activities (Norman *et al.*, 2023). Findings from related research find that appropriately designed activities help students develop critical thinking skills (Baeten *et al.*, 2010; Hidayat *et al.*, 2023). The students were able to manage the time needed to study the material as many times as they wished. Educational material is the main pillar of teaching and learning in distance learning environments, either stand-alone or supplementary, as they provide opportunities that motivate students and actively engage them in the educational process. The necessary attention was given to each element of the modules of the digital educational application, as each of them has its own contribution, performing a defined role in order to thrive and develop conditions for active learning (Lionarakis, 2008; Fragaki & Lionarakis, 2011; Bates, 2016).

5. Conclusions

Equity is a long-standing concern of education, particularly in the 21st century, given the constant changes and increasing demands at all levels. Ensuring Human Rights is more central than ever before. The right to education in modern times can be secured by the existence and adoption of openness. However, openness presupposes that education should be accessible, inclusive, and non-discriminatory against specific social groups. In this context, the use of digital technologies is necessary for the educational process taking place within prisons in order to promote changes and transformations in its product and process in the field of education. The introduction of ICTs has shaped a new culture, the 'information culture', which is put at the service of the learning procedure.

The search for solutions involving dialogue between different pedagogical approaches and technological resources is fundamental to promoting quality education in prisons. Ensuring that students in prison settings develop skills and competences is a key element of education. Nevertheless, to make this a reality, it is necessary to thoroughly redesign the architecture of information systems in prisons, providing them with diverse digital capabilities that allow for the implementation of the distance learning mode.

We have confirmed the availability of time to study trainees and found that the educational resources to which they have access are scarce and limited. The greatest difficulties are related to the lack of guidance on what to study, the need for more effective support from teachers in monitoring pedagogical activities and the lack of access to the Internet.

The subjects of this research raised issues and challenges related to digital skills and the need for complementary distance education in the case of the prison population. Teaching appropriately enriched in context and content with the proper use of mobile educational applications improves learning outcomes in the classroom. The availability of learning opportunities in correctional facilities drastically reduces the likelihood of recidivism and increases the likelihood of positive social reintegration.

The necessity for learners to have access to the learning opportunities of digital media, particularly smart educational applications on mobile devices, was identified. However, without a solid knowledge and experience base according to which educators evaluate and integrate educational applications into the daily lives of institutionalized learners, they will not be able to achieve the proper and effective integration of mobile technology in their environment and in the classroom in particular to enhance the cognitive and social development of institutionalized adults.

Learners and teachers alike can benefit from the availability of valid and easy-to-use information on how to promote the creative use of smart mobile devices and their accompanying educational applications in formal and informal learning environments even in an incarcerated environment where the possibilities are limited; but where a non-internet-based educational application can work in developing cognitive and social skills. Learners acknowledged that the educational materials are structured in a way that supports and guides the learners on the steps to take in order to meet their needs in the prison context. They also noted that the friendly language that permeates the texts can create a sense of familiarity and closeness with the learner. Furthermore, as one student noted, *"the exercises and activities provide a feedback framework that can help each student understand concepts according to their daily needs."*

An improvement was found in the level of students' interest in participating in the course activities as they were understandable, allowed for personalised learning and were accompanied by fairly satisfactory expectations of good performance in the course. The learners' involvement in the process of completing the application-documents proved to be particularly beneficial as the beginning of the voice heard in each activity complemented any difficulties, making the process interesting for them.

Based on the data collected and analysed, it is concluded that there are differences in adaptation to distance education according to the context in which it is implemented. Due to the conditions they experience, the incarcerated learners consider flexibility in time and increased free time as an important positive factor in the operation of distance education. This free time was also used for self-teaching. Audio and video recordings can only be suggested as supporting material to help students acquire practical skills.

Distance education requires flexible communication, good preparation and the availability of quality study materials without excessive text in the prison inmate population. For this purpose, an appropriate amount of supporting material was selected with guidance to the trainees on how to work with the material and how to select information with 'control for proper understanding of the study texts.

We conclude that a hybrid form of learning, which allows each learner to choose an alternative learning approach according to personal preferences and to combine different alternative learning activities, emerges as a solution in the context of incarcerated adults. Furthermore, for distance education to be successful, it is necessary to ensure that learners have sufficient information about the conditions of their studies, with access to quality educational materials, and have the necessary skills to use ICT effectively in their learning. Teachers should also adapt their teaching to the nature of the study.

8. Recommendations

Although the findings of the study highlight the importance of providing supplementary distance learning in the prison environment, they are not generalisable due to the limitations in the number of participants. For this reason, it is proposed that a larger research be conducted, possibly including inmates from more institutions in Greece, so that the results can be generalizable and with the possible purpose of a potential and systematic production of targeted educational material for this vulnerable social group.

Conflict of Interest Statement
The authors declare no conflicts of interest.

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