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Universal Design for Learning and ICT in the Physical Education Area: design and validation of an intervention proposal

Diseño universal para el aprendizaje y TIC en el área de educación física: diseño y validación de una propuesta de intervención

体育学科学习和信息通信技术的通用设计：干预方案的设计和验证

Универсальный дизайн для обучения и ИКТ в области физического воспитания: разработка и проверка проекта действий

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Abstract

This work is proposed with the objective of designing and validating an intervention program for the Physical Education area applying Information and Communication Technologies and Universal Design for Learning, to favor the inclusion of students with intellectual functional diversity of fourth year of Primary Education, through an evaluative research design. For the validation of the program mentioned through expert judgment, an *ad hoc* instrument is designed. In the statistical treatment, the Kendall concordance index shows the existence of concordance between the evaluators, which allows to favorably validating the proposed intervention. The conclusions reflect on the need to design programs on this subject, which allow guaranteeing the participation of all students in educational processes.

Keywords: Physical education, information technology, communication technology, teaching program.

Resumen

Este trabajo se plantea con el objetivo de diseñar y validar un programa de intervención para la asignatura de Educación Física, aplicando las Tecnologías de la Información y la Comunicación y el Diseño Universal para el Aprendizaje, para favorecer la inclusión de los alumnos con diversidad funcional intelectual de cuarto curso de Educación Primaria, a través de un diseño de investigación evaluativa. Para la validación de dicho programa a través del juicio de expertos, se construye un instrumento *ad hoc*. En el tratamiento estadístico, el índice de concordancia de Kendall, muestra la existencia de concordancia entre los evaluadores, lo cual permite validar favorablemente la propuesta de intervención planteada. Las conclusiones reflexionan sobre la necesidad de diseñar programas en esta temática, que permitan garantizar la participación de la totalidad del alumnado en los procesos educativos.

Palabras clave: Educación Física, Tecnología de la Información y la Comunicación (TIC), programa de enseñanza, Diseño Universal para el Aprendizaje (DUA).

概要

本研究的目的是应用信息和通信技术以及通用学习设计，设计和验证一项体育学科的干预计划，通过评估性研究设计，促进对小学四年级具有智力功能多样性的学生的包容性。为了通过专家判断验证所述程序，我们设计了一个临时工具。在处理统计数据过程中，Kendall一致性指数显示评估者之间存在一致性，这使得所提出的干预措施得到了有利的验证。结论反映了设计该主题项目的必要性，以保证所有学生参与教育过。

关键词：体育，信息和通信技术，教学计划，通用学习设计。

Аннотация

Целью данной работы является разработка и проверка программы обучения по предмету “Физическая культура” с использованием информационно-коммуникационных технологий и универсального дизайна обучения для содействия включению учащихся с функциональным интеллектуальным разнообразием в четвертый год обучения в начальной школе с помощью оценочного метода исследования. Для валидации этой программы с помощью экспертной оценки был разработан специальный опросник. При статистической обработке индекс конкордации Кендалла показывает наличие

согласованности между оценщиками, что позволяет положительно оценить предлагаемое вмешательство. Сделанные выводы свидетельствуют о необходимости разработки программ в этой области, гарантирующих участие всех студентов в образовательном процессе.

Ключевые слова: Физическая культура, информационно-коммуникационные технологии, программа преподавания, универсальный дизайн обучения.

Introduction

The current society in which we live is subject to constant changes due to the appearance of the so-called Information and Communication Technologies (hereafter ICT), through which a growing number of sectors of society are keeping up with these advances to avoid falling behind. Regarding this aspect, the educational sector cannot be less. The socio educative relevance of the research problem which is posed in this article lies precisely here, since a progressive change to that new society of knowledge which is being created through the appearance of ICT must be made. Its application will bring about a major breakthrough in educative practice, helping to improve the learning process and fostering the integral and competence development of our learners.

Taking into account that this work will be developed on the Physical Education area, we must understand that this research problem contributes to solve a real issue: the introduction of technologies in the Physical Education Area to improve the learning process in pupils who suffer from an intellectual functional diversity. This has posed a hurdle to this day due to the eminently practical nature of this subject. Hence, the development of new knowledge is being fostered by the design of this paper, filling knowledge gaps in relation to the teaching of Physical Education in the Primary Education field by using the Universal Design for Learning.

Universal Design for Learning

Universal Design For Learning is outlined as a favourable solution to tackle educational exclusion and it has been designed by the Center for Applied Special Technology (CAST, 2011). This design is focused on the curricular design to find out where the failure of many students stems from (Pastor et al., 2014).

Universal Design for Learning reveals that the educational models which regulate the current education are focused on paying attention to certain students, leaving a certain minority of pupils behind, on the grounds that most students learn in an analogous way. In this line, Rose and Meyer (2002, cited in Pastor et al., 2014), indicate that: "[...] the boundaries for learning are not, indeed, inherent to student skills, as they emerge from their interaction with methods and inflexible materials" (p.4).

In the same direction, Cantó et al. (2020) point out that the Universal Design for Learning Design contributes two fundamental facts on this matter:

- The duality between students with or without functional diversity disappears, allowing for a broad range of possibilities to reach learning.

- The spotlight changes from the student with functional diversity to the curricular design and materials.

Universal Design for Learning is developed under the identification of three knowledge networks which are a matter of the utmost importance for the learning process of all students. Every network is related to a principle of the Universal Design for Learning, which will be shown later. The three knowledge networks are further explained in Table 1.

Table 1

Brain networks and learning

Recognition networks	Specialised in noticing information and assigning meanings to it. In practice, these nets allow the recognition of letters, numbers, symbols, words, objects, etc.
Strategic networks	Specialised in planning, executing and monitoring motor and mental tasks. In practice, these nets allow people to do several tasks, from taking a book out of a bag to designing the structure and writing a text analysis.
Affective networks	Specialised in assigning emotional meanings to tasks. Related to motivation and implication of their own learning. In practice, the nets are influenced by people's interests, mood or previous experiences.

Note. Adapted from Rose and Meyer (2002, cited in Pastor et al., 2014, p.13)

The main goal of Cast (2011) is to furnish a more flexible curriculum, to guarantee learning access to those pupils who represent a minority. The use of ICT in this process makes the learning process easier for this group of students.

As a general rule, current educational reality presents educational practice including traditional methods of learning: e.g. a text book for master classes or the student role as a mere listener while the teacher is the main actor of the educational process. These methods have been harnessed for many years and could be useful for certain learning tasks, yet they are deemed to be useless for pupils suffering from any type of functional diversity.

Likewise, the different professionals in charge of planning the learning process must be aware of the wide range of accessible possibilities to provide all students with the same opportunities to finish their tasks and get a certain level of learning. Therefore, authors like Luengo Horcajo et al. (2021) highlight how the new curricular regulation established by the Organic Law 3/2020, from December the 29th, that modifies the Spanish Organic Law 2/2006, from May the 3rd (LOMOE, 2020) is clearly committed to the design of interventions focused on the competence development of students. This regulation also takes into account educational inclusion as one of its main transversal axis and it states the application of Universal Design for Learning as a fundamental element, therefore fostering the fulfillment of the Sustainable Development Goals, established by the High Commissioner for the 2030 Agenda (2019) and contributing more specially to the fulfillment of their fourth goal about "Inclusive and Quality Education". Getting to this point, digital means are clearly gaining importance, being able to help individualise the learning process in order to attend diversity and boost the attention and motivation skills of students. All of this will help us to develop a positive

learning environment, improving the motivation of our pupils, being also influenced by the individual interests of our learners (Ramírez, 2018).

Notwithstanding the fact that many professionals inside the educational field may consider digital means similar to traditional ones due to the fact that they allow us to visualise images or text, they differ from them since they can be easily merged (Pastor et al., 2014). In addition, the appearance of technologies as attachment to traditional means has entailed a change in the educational tendency of didactics; most of all during the pandemic and post-pandemic context of the Covid-19, in which the change of learning context from school to house posed a challenge to reshape other methods and resources. This event inevitably broke with those methods that had already been traditionally established and fostered the development of the learning process in turbulent times (Hernández-Ortega & Álvarez-Herrero, 2021). All of this, in words of Castañeda and Adell (2013) has further favoured the change of the personal learning environment (PLE) of students, from one traditionally focused on the education centre and its resources, to another more technological environment contextualised not only in the education centre but also out of it, which offers an endless source of information.

Based on the above, Rose and Meyer (2002, cited in Pastor et al., 2014) stress the advantages brought by the use of technological means in lieu of traditional means:

- *Versatility:* technologies can store information and contents in multiple formats; it is even possible to combine them. Thus, a single content can be presented in several formats (audio, video, text, image), so that people with different disabilities (visual, hearing) can access it. In addition, the combination of formats (e.g. subtitled video) enriches learning.
- *Transformability:* traditional means can store information by separating content from the format in which it is presented. This allows the student to access the content using the format at will, or even to transfer the information from one mean to another.
- *Ability to mark them:* the information format can be modified (type of letter, size, bold, italic, underlined, etcetera.)
- *Ability to network them*: contents can be related to one another, so that it is possible to easily and quickly move from one to another, being able to greatly enrich the learning process.

Considering the above propositions, if we were to harness technology without reshaping the traditional ways of learning, we would be doing things wrong. Adaptations must be made to these resources depending on the necessity of our students. Likewise, Universal Design for Learning is shaped by three essential principles directly related to the three knowledge networks (Cast, 2011, cited in Pastor et al., 2014).

The three principles described below are based on the idea that access routes to the educational process must be offered by the teachers to students. Therefore, Pastor et al. (2014) explain the three principles of Universal Design for Learning as follows:

- *Principle I.* Furnish the students with many forms to represent the information and contents (the what of learning), since students are different in the way they perceive and understand information.

- *Principle II.* Provide students with multiple forms of learning expression (the how of learning), since each person has their own strategic and organizational skills to express what they know.
- *Principle III*. Supply multiple forms of implication (the why of learning), so that all students can feel engaged and motivated during their learning process.

In this way, with these three principles, the content can reach the student in several ways thanks to Universal Design for Learning. The possible paths to consolidate learning and the different ways of participation in the learning process remove to the extent possible the barriers that previously prevented students from being part of this process.

Once the relevant aspects of the Universal Design for Learning have been addressed, it is crucial to bear in mind that when posing possible intervention proposals on students with functional diversity in the Physical Education area, we must first make an approximation to the concept of intervention programme, in order to highlight its most relevant characteristics.

Intervention Proposal in the Physical Education area

When posing future intervention proposals on pupils with functional diversity in the Physical Education area, a first approach to different aspects of the utmost importance must be always made when considering educational interventions of any kind.

Concerning the legislation in force in our country on the educational system, we have a broad range of references that highlight the main relevance of the teaching work in our country and society. Plus, in article 27 of Spanish Constitution, education appears as a fundamental right. In addition, Organic Law 3/2020, of December the 29th, which modifies the Spanish Organic Law 2/2006, of May the 3rd (LOMLOE), modifies paragraphs 1 and 3 of article 2 bis of Spanish Organic Law (LOE), defining the Spanish educative system as follows:

> The ensemble of educational Administrations, education professionals and other agents, public and private, that carry out functions of regulation, financing or provision of services for the exercise of the right to education in Spain, and the holders of this right, as well as the ensemble of relationships, structures, measures and actions that are developed for this purpose. (p.14)

Based on the aforementioned information, since the signing of the Spanish Constitution in 1978, there have been many legislative referents that compose the current educative system in Spain on a curricular level and which establish the legal basis of the elements that will be included in the intervention programme to be later developed in this work.

Once we have contextualised the proposal in a legislative manner, it is relevant to make a terminological approach to the intervention programme concept. Below we present a suitable definition, showing all its elements and relevant characteristics. In this sense, García Sanz (2012) defines the concept of intervention programme as follows:

> A technical and systematically elaborated document, aiming at the fulfillment of certain goals in a specific socio-educative sphere, in which some necessities have been previously established, which is translated to an intervention, with the goal of improving particular aspects of the reality and the people who belong to it. (p.228)

From this provided definition we can conclude that an intervention programme tackles specific necessities previously established, which can be specified in the objectives that the intervention programme aims to fulfill. Subsequently, we can extract that intervention programmes seek to contribute to modifying and improving the quality of education.

Contextualizing in the Physical Education area, the idiosyncrasy of this field makes educational interventions different from the rest of subjects. In this line, Rosa and García-Cantó (2018) establish specifications to design intervention programmes in the Physical Education area, such as taking into account the use of conventional, non-conventional and supplementary materials, bearing in mind the diverse pedagogical variables implied in motor practice, the variety of possible practice environments (stable, like the pitch of the school, and non-stable, like natural environment), as fostering the complete development of the functional diverse pupil by proposing tasks or exercises that boost their self-sufficiency (Ríos, 2019). In addition, the contribution of Romero Cerezo et al. (2008) revolves around the importance of practice and recovery time of students, considering the time lost when we explain and organize the activities. In this sense, the personal characteristics of students should be attended, offering playful situations in which they participate by having active roles and with activities that foster cognitive development through inquiry, with the main goal of soaring the active practice time of students, offering the maximum possible time of motor engagement.

More specifically, there exist intervention proposals with characteristics similar to those proposed in this study. Precisely, authors like Rosa and García Cantó (2018) propose a stack of activities pointing to educative inclusion of students with sensory functional diversity through motor games in the Physical Education area. Likewise, García Cantó et al., (2020) conduct an interesting intervention proposal in students with both physical and intellectual functional diversity applying Universal Design for Learning and being conscious of the characteristics and needs of each student in order to foster a suitable educational inclusion.

In addition to the above, several intervention proposals related to the promotion of physical activity are also worth noting, such as the one conducted by Sáez and Caravaca (2021) focused on the promotion of physical activity assisted by animals in people suffering from mental illnesses, getting positive results in terms of sport motivation and revealing the crucial role of physical activity in order to boost social development and health promotion.

Currently, we are living in a moment of transition in which the use of ICT is gaining momentum, so learning professionals have to be capable of integrating ICT in their educational interventions, as an essential means to contribute to boost student's learning in a positive way (Ruiz Aquino et al., 2022).

Therefore, for Hernández Ortega (2016) the appearance of digital means has implied a transfiguration of attitudes and behaviours that forces us to apply a change regarding the previously known. In this sense, a study conducted by this author shows how the use of ICT in order to boost orality in pupils can also foster their competence development, being crucial for that to promote that students face unknown challenges that, in

addition, increase their motivation and attraction for those activities. If we are able to unite all these points using new technologies and new learning methods, we will give rise to authentic significative and competence learning.

Apart from this, the Physical Education area possesses a practical eminent character oriented to mobility development and physical activity and this may cast doubts about the possibility of integrating interventions that imply the use of technology in this area. However, research shows that adequate levels of mobility are not always linked to low levels of technological leisure (Biddle et al., 2004). Therefore, there can be planned activities that integrate the rise of ICT together with Universal Design for Learning with the main goal of developing an integral learning process in our students.

In addition, several authors like González Arévalo et al. (2021) highly recommend the use of ICT in the Physical Education area, bringing a much needed new perspective that interrelates technology, pedagogy and curricular knowledge. Based on this, and attending to the research conducted by Ramírez (2018), it is essential to comment that the prolonged use of ICT combined with physical activity may result discouraged after 12 weeks. In order to avoid this discouraged effect we must put a curb on the programme length to avoid counter-productive feelings in our learners. Therefore, the educational character of ICT will depend on their use by teachers, being crucial to establish their pedagogical characteristics to foster integral and competence development of the students.

On this basis, the goal of the present study is to design and validate an intervention programme for the Physical Education area using ICT and Universal Design for Learning for students with intellectual functional diversity studying the fourth course of Primary Education field, through an expert judgment. For this, an intervention programme will be designed, and later an information gathering tool will also be designed in order to assess the intervention programme on the basis of the information collected from the gathering tool.

In this sense, according to Fernández-Collado and Baptista-Lucio (2014, cited in Collet et al., 2018), the process of elaborating the gathering tool must be carried through with the verification of content validity and reliability before putting them into practice in the participant sample group. That aforementioned process should strengthen the quality of the information gathering process as an essential part of educational research (Velandia-Mesa et al., 2020).

Method

This paper imitates the design of an evaluative research or programme assessment, that allows to carry out a thoughtful activity of the programme through an assessment process carried out by experts judgment. Therefore, according to Escudero (2016) the design of a programme assessment could be framed in a change-oriented scope seeking to establish significant changes in society. Within this design, many *specific objectives* are trying to be fulfilled:

- SO1. Designing an intervention programme for the Physical Education subject to boost educational inclusion of students with intellectual functional diversity through Universal Design for Learning and the use of ICT.
- SO2. Designing and validating a gathering tool that will be harnessed to assess the programme.

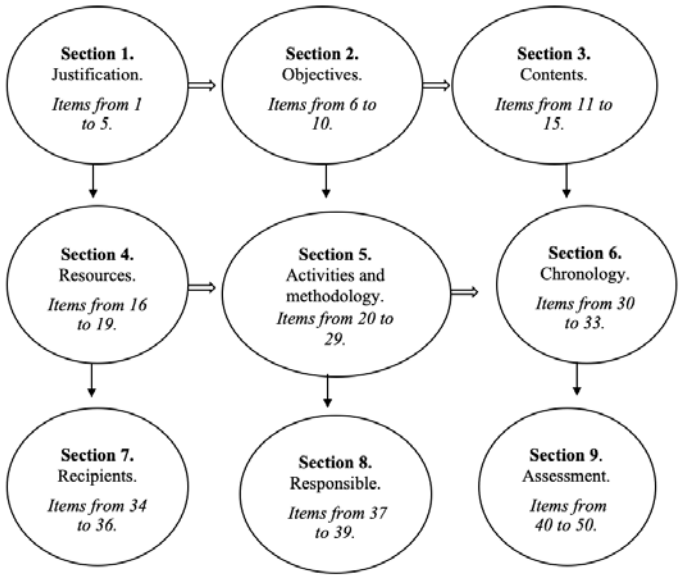
- SO3. Assessing the potential quality of the intervention programme through valuations of an expert group, using an *ad hoc* designed tool and validated for this purpose.

The participant sample group has been selected by criterion of accessibility to it, being a requirement that participants of this study were Physical Education teachers in Primary Education centres, so that they could successfully validate the intervention programme proposed in this study. Prior to the data collection, the sample group signed an informed consent form in which it was verified that the information included in the information gathering questionnaire had a merely academic purpose. All of them are Physical Education teachers (14 men and 11 women), with an average age of 34.14 years old, working as teachers in public centres, graduated in Primary Education and, 8 of them graduated in Physical Activity and Sports Science, among whom one is a doctorate in Education. In relation to the teaching experience of each participant, they fluctuate from 3 to 11 years of teaching experience, teaching at several levels within the Primary Education field. In addition, 2 experts who teach in the University of Murcia have also intervened in this study, whose function consisted of validating the content of the instrument of information gathering.

Regarding the choice of the most suitable instrument, the attitude scale was selected, due to the fact that it is aimed to obtain information from the population through an approval or disapproval valuation (García Sanz, 2012). Based on the objectives proposed in this research, an *ad hoc* information gathering tool has been designed with a Likert scale, the final version can be found in López Ibáñez et al. (2021a). In this line, Figure 1 shows a brief summary of the information gathering tool.

Figure 1

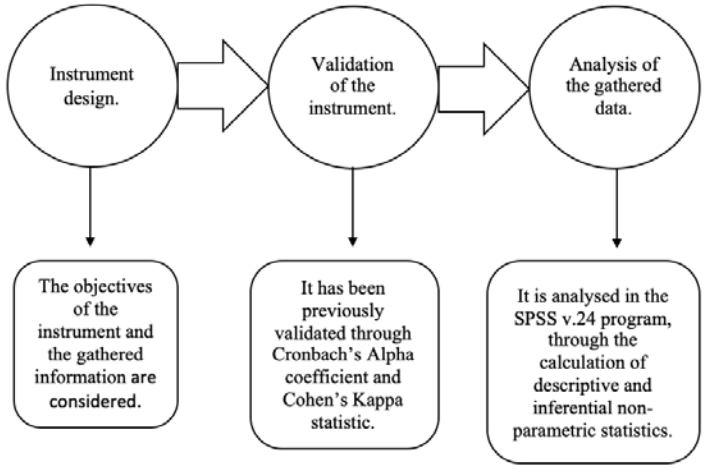
Structure of the information gathering tool



In addition, Figure 2 shows the process followed to create this study has been carried out following the process shown in Figure 2 below.

Figure 2

Phases of research process



Results

Concerning the results, they will be organized according to the sequence of the several specific objectives in which the research objective of this study is itemized. In this way, the results are the following:

Result 1. Design of the intervention programme

In order to fulfill this objective an intervention programme has been designed, under the title "Physical Education Easy: sport and health", and it consists of accomplishing a learning process in students with intellectual functional diversity in the Physical Education area in the Primary Education stage by using ICT. Following that programme, the teacher will carry out a stack of activities using technological resources and applying the standards of Universal Design for Learning.

In addition, the necessity of carrying out the programme is based on literature review, which shows evidence that these students are limited in several development areas. Its main objective is focused on the improvement of the cognitive field, the communication and language field and the socio-affective field.

Likewise, some contents directly extracted from Annex 1 of Decree 198/2014, from September 5th, will be taught to the students by using different technological resources, such as *tablets*, digital resources, virtual reality or *Wii Sports*. All of this will be done from a competence methodological perspective, according to the information established in Annex 2 of Order ECD/65/2015, from January the 21st, through the use of ICT to boost their individual autonomy, combined with cooperative learning structures to improve the socio-affective interaction of students, with the teacher guiding and promoting educational process.

Furthermore, in relation to assessment, certain piece of advice extracted from the Order of November 20, 2014, will be considered, establishing a continuous, formative and global evaluation. Evaluation criteria and learning standards extracted from the aforementioned Decree 198/2014, from September the 5, will also be considered, related to the competences and objectives that our students pretend to reach, and according to the information established in Order ECD/65/2015, from January the 21st.

Finally, a brief summary of the elements of the intervention programme are shown (Table 2), the final version of the programme can be found in López Ibáñez et al. (2021b), a flexible version open to different educational realities and future modifications.

Table 2

Elements of the intervention programme "Physical Education Easy: sport and health"

Justification	A brief theoretical explanation of the designed programme is made specifying that its purpose is to foster educational inclusion of students with intellectual functional diversity harnessing ICT and Universal Design for Learning as crucial elements.
Objectives	The objectives of the intervention programme are established, i.e. mainly to boost the improvement of cognitive capacity, socio-affective capacity and the communication and language of students.
Contents	The contents address essential aspects such as decision making in complex game situations, motor problems resolution in global situations or responsible practice of diet self-management, among others.
Resources	The successful development of the programme requires the use of resources like the sports court of the centre or the psychomotricity room, a computer in classroom, a digital board, virtual reality glasses, *tablets*, a *Wii* console and internet access.
Methodology and activities	The programme includes 6 activities and each one includes the pedagogical variables (task, competences, objectives, contents and organisation), the material, the initial situation of students, the development and rules, the principles of the Universal Design for Learning applied to each activity, as the criteria or standards to assess the activities.
Chronology	A chronology proposal is included in the program dividing the activities in different sessions; in spite of being illustrative, the theoretical activities about diet can be combined with motor activities of *Wii Sports*.
Recipients	The recipients are mainly the students of the fourth course of Primary Education stage.
Responsible	The main responsible will be the Physical Education teacher.
Evaluation	Not only the referents but also the instruments to assess the learning process are established in this section.

On another note, and based on the table, Figure 3 shows an example of one activity extracted from the designed programme.

Figure 3

Activity nº. 1 of the intervention programme

Activity 1. Bowling		
Pedagogical variables	– *Task*	Motor game
	– *Competences to work*	Learn to learn, sense of initiative and entrepreneurial spirit, digital competence, cultural awareness and expressions
	Objective of the activity	Foster the improvement of their cognitive capacity, as much as their health state, through the practice of physical activity
	– *Content*	Decision making during complex game situations
	– *Organization*	Individual
Material	Virtual reality (Wii-sports)	
Initial situation	The students will be standing, holding the control and waiting for the game tostart	
Rules and development	The student must knock over the maximum of pins to win the game	
Methodological principles	*Principle I* - 1.2. Offer alternatives for auditory information	Using subtitles in the virtual reality activities.
	1.3. Define the vocabulary and symbols.	Including visual aid to tackle possible comprehension issues of the vocabulary that could appear in the activities
	Principle II - 2.1.Integrate access to tools and assistence technology	Providing an accessible software of students in the proposed task (virtual reality)
	- 2.4. Support information and strategy development	Making notices of the type "stop to think"
	- 3.1. Optimise relevance, value and authenticity	Designing viable and real activities
	Principle III - 3.2. Minimise feelings of inseurity and distractions	Creating class routines, to promote personal autonomy, so that the student is spruced up autonomously at the end of the class through their own initiative
	3.4. Provide targeted feedback	During the activity, provide feedback on improvement guidelines by identifying patters of improvement or incorrect actions, being an important guide in the learning process of students
Asessment	For the assessment of this activity the learning standard 2.2 will be considered, which will be assessed by using a descriptive scale, as you can see in the evaluation section at the end of the programme.	

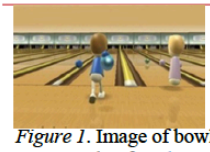


Figure 1. Image of bowling game to do through virtual platform.
Source: Taken from https://bit.ly/2PGkp0p

Note. Taken from "*Programa de intervención educativa: Educación Física Fácil: deporte y salud" by* F. J. López Ibáñez, M. J. Martínez Segura, & A. Cascales Martínez, 2021b, Editum.

Result 2. Validation of the information gathering tool that will be harnessed to appreciate the designed programme.

The evaluation of the information gathering tool will be carried out to give a response to the following objective of the current article, allowing us to assess the intervention programme designed afterwards.

The content validity of the tool reveals that the theory is adequate based on several previously established criteria. The content validity has been conducted by a dichotomous scale which has been complemented by two expert judges who teach in the University of Murcia. Bearing in mind the information mentioned above, the *Cohen's Kappa* index will be used (Escobar-Pérez & Cuervo-Martínez, 2008).

Kappa coefficient will give us a measurement that generally turns around the value -1 and 1, showing a total agreement if the result is 1, yet if that value is equal to 0 it shows that the agreement is less than the expected by probability.

The criteria used to carry through with this process have been proposed by Escobar-Pérez and Cuervo-Martínez (2008) and they are listed below.

- Sufficiency: items belonging to the same dimension are sufficient to obtain the measurement of that dimension.
- Clarity: the item is easy to understand, its syntactic and semantics are suitable.
- Coherence: there is a logical relationship between the item and the dimension at value.
- Relevance: the item is essential and must be included.

In order to carry out a correct analysis, a statistical hypothesis must be posed, allowing us to find the validity of the results, after contrasting them. In this line, the statistical hypotheses are the following:

H_0: there is no concordance among the judges.

H_1: the judgments among the judges concur.

For the contrast of the hypotheses an *alfa* critic level of .05 will be considered, being the result below this level the most adequate in order to be considered as significant, allowing us to accept the null hypothesis.

Conversely, concerning *Kappa* value, we have to bear in mind the intervals proposed by Landis and Koch (1977) and Chaturvedi and Shweta (2015), which allow us to measure the concordance intensity among the judges as it is shown below.

- 0 - .4: poor concordance.
- .40 - .60: moderate concordance.
- .40 - .80: substantial concordance.
- .80 - 1: almost perfect concordance.

Taking these aspects into consideration, Table 3 shows the results of the Cohen's Kappa coefficient.

Table 3

Results of the Cohen's Kappa coefficient

Results of concordance among judges				
Criteria	Cohen's Kappa value	Asymptotic standard error	T approximate	Sig.
Sufficiency	.769	.212	2.372	.018
Clarity	.851	.103	6.019	.000
Coherence	.834	.113	5.983	.000
Relevance	.847	.150	6.058	.000

In relation to Table 3, the results show a significant concordance among the judges in *sufficiency criterion* (p< .05), thus nothing is posing opposition in accepting the alternative hypothesis, which indicates a significant concordance among the judges estimating that the items of the gathering tool are essential and must be included. In addition, the *Cohen's Kappa* coefficient generates a value of .769, which is a sign that concordance strength among experts is substantial (Landis & Koch, 1977; Chaturvedi & Shweta, 2015).

Secondly, we can also see that the results show the existence of significant concordance among the judges in *clarity criterion* (p< .05). Thus, we accept the alternative hypothesis, which indicates a significant concordance among the judges estimating that the items of the gathering tool are essential and must be included. Besides, the *Cohen's Kappa* coefficient generates a value of .851, which is a sign that concordance strength among experts is almost perfect (Landis & Koch, 1977; Chaturvedi & Shweta, 2015).

We can also appreciate the existence of significant concordance among the judges in *coherence criterion* (p< .05), which indicates a significant concordance among the judges estimating that the items of the gathering tool are essential and must be included. In this case, the *Cohen's Kappa* coefficient generates a value of .834, evincing that concordance strength among experts is substantial (Landis & Koch, 1977; Chaturvedi & Shweta, 2015).

Following this line of work, we can also see that significant concordance exists among the judges in *relevance criterion* (p< .05). Thus, we accept the alternative hypothesis, which indicates that judges estimate that the items of the gathering tool are essential and must be included. In this sense, the *Cohen's Kappa* coefficient generates a value of .847, which is a sign that concordance strength between among is almost perfect (Landis & Koch, 1977; Chaturvedi & Shweta, 2015).

In order to measure reliability, the Cronbach's Alpha is used, showing a value of .726, which is placed above the 0.7 value, thus the result of the coefficient is acceptable according to the criteria proposed by George and Mallery (2003).

Once we have designed an acceptable and reliable instrument consistent with the objectives that this study aims to fulfill, the next step was to send the gathering tool together with the intervention programme to the selected teachers so that they could evaluate it. The results of this evaluation are shown in the next objective.

Result 3. *Validation of the intervention programme through an expert group.*

In order to assess the design of the program, the designed and previously validated tool has been used. The aforementioned tool allows us to assess the programme around the dimensions in which it is composed. With the information received by the participant sample group, a descriptive analysis of the assessments submitted by evaluators has been carried out. In this sense, Table 4 shows the results of the descriptive statistics that have been calculated for each section of the programme.

Table 4

Results of descriptive statistics for the sections of the programme

Dimension	N	Minimum	Maximum	Average	Typical deviation	Q1	Q2 Md	Q3
Justification	5	3	4	3.94	.035	3	4	4
Objectives	5	3	4	3.89	.107	3	4	4
Contents	5	3	4	3.88	.177	3	4	4
Resources	4	2	4	3.5	.415	2	3	4
Activities and methodology	10	3	4	3.96	.029	4	4	4
Chronology	4	3	4	3.95	.020	4	4	4
Recipients	3	3	4	3.93	.023	4	4	4
Responsible	3	3	4	3.92	.023	4	4	4
Assessment	11	3	4	3.97	.016	4	4	4

In respect of Table 4, the average value (*Md* = 4) reflects the central position of all values except for the resources dimension equivalent to 3. If we take into account that the scale used to assess the programme measures from 1 to 4, these values show that central position of valuations in each dimension is high, translated into positive results. In the case of the resource dimension, the average value is not excellent, yet acceptable. That value is the result from the low valuation of judges on the item related to resource availability, i.e. it confirms that, despite being suitable resources, availability is not guaranteed in all educational centres.

Furthermore, the *W* Kendall rank correlation coefficient was also used to measure the concordance grade among evaluators. Likewise, the establishment of several statistical hypotheses has been necessary to clarify to what extent the results are acceptable. In this sense, the statistical hypotheses are the following:

H_0: there is no concordance among the judges.

H_1: the judgments among the judges concur.

An alfa critic level of .05 has been taken into account as a way to contrast the hypotheses and a lower value would be necessary to achieve significant results.

Apart from that, in relation to the *Kendall coefficient,* we have considered the intervals proposed in Landis and Koch *(1977) and* Chaturvedi and Shweta (2015), which allowed us to measure the intensity of the concordance among the judges as it is shown below.

- 0 - .4: poor concordance.
- .40 - .60: moderate concordance.
- .40 - .80: substantial concordance.
- .80 - 1: almost perfect concordance.

In relation to the *W Kendall coefficient* statistic, regarding the *justification* dimension, there exists statistically significant concordance among the judges (*p< .05, c = 91.610, gl = 24, p= .000)*; thus, nothing shows opposition to accept the alternative hypothesis, which indicates a significant concordance among the 25 judges estimating that the 5 items of this dimension are essential and must be included. Moreover, the *W Kendall coefficient* (*W = .763*) demonstrates that concordance strength among experts is substantial according to the criteria proposed in Landis and Koch (1977); Chaturvedi and Shweta (2015).

Secondly, regarding the *objectives* dimension, there exists statistically significant concordance among the judges (*p*< .05*, c* = 104.370*, gl = 24, p*=.000*)*; thus, we accept the alternative hypothesis, which indicates a significant concordance among the 25 judges estimating that the content of the programme is essential and must be included. Apart from that, the *W Kendall coefficient (W* = .870*)* demonstrates that concordance strength among experts is substantial according to the criteria proposed in Landis and Koch (1977); Chaturvedi and Shweta (2015).

Thirdly, regarding the *contents* dimension, there exists statistically significant concordance among the judges *(p*< .05*, c* = 85.095*, gl* = 25*, p*=.000*)*; thus, we accept again the alternative hypothesis, which indicates a significant concordance among the 25 judges estimating that the content of this dimension is essential and must be included. Besides, the *W Kendall coefficient (W* = .709*)* establishes that concordance strength among experts is substantial according to the criteria proposed in Landis and Koch (1977); Chaturvedi and Shweta (2015).

Fourthly, regarding the *resources* dimension, there exists statistically significant concordance among the judges *(p*< .05*, c* = 63.338*, gl = 25, p*=.000*)*; thus, nothing shows opposition to accept the alternative hypothesis, which indicates a significant concordance among the 25 judges estimating that the content of this dimension of the programme is essential and must be included. Furthermore, the *W Kendall coefficient* (*W* = .660) establishes that concordance strength among experts is substantial according to the criteria proposed in Landis and Koch (1977); Chaturvedi and Shweta (2015).

Fifthly, regarding the *activities and methodology* dimension, there exists statistically significant concordance among the judges (*p*< .05, *c* = 196.639, *gl* = 25, *p*=.000); which indicates a significant concordance among the 25 judges estimating that the content of this dimension of the programme is essential and must be included. In addition, the *W Kendall coefficient* (*W* = .819) is proof that concordance strength among experts is almost perfect according to the criteria proposed in Landis and Koch (1977); Chaturvedi and Shweta (2015).

Sixthly, concerning the *chronology* dimension, there exists statistically significant concordance among the judges (p< .05, c = 81.356, gl = 25, p= .000); thus, nothing shows opposition to accept the alternative hypothesis, which indicates a significant concordance among the 25 judges estimating that the content of this dimension is essential and must be included. Moreover, the *W Kendall coefficient* (W = .847) demonstrates that concordance strength among experts is almost perfect according to the criteria proposed in Landis and Koch (1977); Chaturvedi and Shweta (2015).

Seventhly, concerning the *recipient* dimension, there exists statistically significant concordance among the judges (p< .05, c = 62.069, gl = 25, p= .000); thus, nothing shows opposition to accept the alternative hypothesis. Regarding the *W Kendall coefficient* (W = .862), it is proof that concordance strength among experts is almost perfect according to the criteria proposed in Landis and Koch (1977); Chaturvedi and Shweta (2015).

Eightly, concerning the *responsible* dimension, there exists statistically significant concordance among the judges (p< .05, c = 54.609, gl = 25, p= .000), which indicates a significant concordance among the 25 judges estimating that the content of this dimension is essential and must be included. Apart from that, the *W Kendall coefficient* (W = .758) demonstrates that concordance strength among experts is substantial according to the criteria proposed in Landis and Koch (1977); Chaturvedi and Shweta (2015).

Finally, regarding the *evaluation* dimension, there exists statistically significant concordance among the judges (p< .05, c = 216.000, gl = 25, p= .000); thus, nothing shows opposition to accept the alternative hypothesis, which indicates a significant concordance among the 25 judges estimating that the content of this dimension is essential and must be included. Besides, the *W Kendall coefficient* (W = .818) proves that concordance strength between experts is almost perfect according to the criteria proposed in Landis and Koch (1977); Chaturvedi and Shweta (2015).

After having analysed the results related to the achievement of the proposed objectives in this paper, the next step is to continue with the discussion of the results to establish a coherent relationship between the theoretical basis supporting this work and the results obtained.

Discussion

On the basis of the described results and regarding *objective one*, which focuses on the *development of an intervention programme*, we assert that the design of the intervention programme is based on bibliography revision. This has been of the utmost importance during the research process allowing us to organise the programme and activities according to acceptable elements which would give response to the objectives of this study. In this line, the recommendation of García -Sanz (2012) has been followed to structure the programme, acquiring particular relevance in the activities and methodology section, which is sometimes annexed in some programmes according to their own objectives. The activities have also been structured according to the model proposed by García Cantó et al. (2020) for intervention programmes in students with intellectual functional diversity in the Physical Education area.

The designed intervention programme has taken into consideration several areas, in which students present difficulties, namely, the cognitive one, the communication and language area, and the socio-affective area (Ríos, 2019). In this line, this paper takes into account the specifications of Rosa and García-Cantó (2018), which help to specify

the intervention guide in the Physical Education area and play a key role to permeate in the prevention of cognitive worsening and language disorder, as much as the maturation and psychomotor development. The proposal of Romero Cerezo et al. (2018) is taken into account as well, boosting the time of practice as much as possible and fostering research activities to improve cognitive capacity of students.

Apart from that, activities and methodology follow the aforementioned methodological guide, taking advantage of ICT as an essential element that contributes to the comprehensive development of students (Ruiz Aquino et al., 2022). Universal Design for Learning acquires relevance, being legally endorsed by Organic Law 3/2020, of December 29th (LOMLOE), in which the fulfillment of its principles is highlighted. Moreover, this design allows us to cancel duality between diverse and non-diverse students, and the curriculum and material design becomes the main focus (García Cantó et al., 2020). In addition, the developed proposal fosters the motivation of students as an essential element of the learning process, due to its length, whichposes no excessive physiological demand for students (Ramírez, 2018).

In relation to *objective two*, which is focused on the *elaboration and validation of the information gathering tool*, a discussion was previously carried out to choose the most suitable instrument according to the objectives established for this research. Finally, the selected option was an attitude scale through a Likert additive scale composed by four levels (García Sanz, 2012).

After the abovementioned design process, a process recommended by Fernández-Collado and Baptista-Lucio (2014, cited in Collet et al., 2018) was carried out for the analysis of the content validity. The results were positive for the criteria used and acceptable for the reliability coefficient used for that analysis. As a result, the data collection tool has been successfully validated, which will guarantee the quality of the information collected during the research process (Velandia-Mesa et al., 2020).

Concerning *objective three*, which is focused on the *statistical validation of the programme*, the results show that the design of this programme can improve several capacities of students, not only in the cognitive area, but also in communication, language and socio-affective skills (Ríos, 2019), according to the positive assessment obtained in the objective section (W= .763; p< .05).

When carrying out the programme in future interventions, a successful implementation entails a series of resources. The results obtained in the resource section of the program (W = .660 ; p< .05) prove that, despite the fact that there is a positive concordance among evaluators, the average obtained is the lowest score amongst the elements of the programme. Nevertheless, this score is considered adequate, which reflects the importance of using ICT to fulfill the objectives of the programme.

This paper shows also evidence that the learning process is expected to be improved by using Universal Design for Learning. The main goal consists in erasing the barriers dividing students with any kind of functional diversity from the rest of the students, according to García Cantó et al. (2020). In this line, the suitability to include ICT in the different learning processes has been proved, more particularly in the Physical Education area, as it poses a technological change in this subject, boosting the educational inclusion processes without affecting the motor nature of this subject (Biddle et al., 2004). Conclusive evidence of the above are the scores obtained in the activities and methodology section (W= .819; p< .05).

Finally, bearing in mind that the values of the *W Kendall coefficient* are high and that the *alfa critic* levels in each dimension have stayed under .05, this section concludes stating a significative concordance among evaluators ($p < .05$). Therefore, the "Physical Education easy: sport and health" intervention programme has been successful and statistically validated, verifying its utility and potential viability in order to be successfully implemented.

Conclusions

Given the obtained results, it can be concluded that the validated intervention programme contributes a wide range of elements that will foster the improvement of educational quality from several perspectives.

Firstly, it will tackle the necessities of students with functional diversity, a much-needed action in current society. Therefore, this paper proposes the implementation of Universal Design for Learning as an element to remove inequality barriers in classrooms, whose aim is to reach real inclusion of functional diverse students. Likewise, a further step is made into an inclusive educational system, guarantee of quality.

Secondly, the design programme suggests the implementation of activities that contribute to boost student's health through physical activity and the acquisition of knowledge. This knowledge is related to the acquisition of motor competence and to the fostering of the capacities of students, and it helps them to manage with the organisation of their diet, providing them with a comprehensive educational process.

Lastly, it is worth highlighting that an assessment process of the programme has been carried out to guarantee its quality. The process consisted of designing a collecting tool to extract evidence about the design of the programme and guarantee the hypothetical implementation of the programme with the strongest possible guarantees of success.

The abovementioned statements prove that educational processes are key in order to assure the quality of our educational system, since they allow us to reflect about mistakes or weaknesses for a later change towards a significant improvement. The implementation of continuous improvement processes is crucial to further improve education. Therefore, there is no quality without evaluation.

Based on the aforementioned data, the designed and successfully evaluated programme differs from other interventions since it provides a vital resource to foster educational inclusion of students with functional diversity by integrating the use of ICT in an area of difficult application such as the Physical Education area. This subject has commonly been focused on an essentially practical and motor character, based on Universal Design for Learning as a fundamental element which has recently shown up in the educational field as a result of the latest educational legislative reform in education.

In addition, a high complex process has been carried out while developing the proposed intervention programme, when the collaboration of professionals within the educational field was required. This was feasible thanks to a questionnaire designed *ad hoc* for this paper, which was sent to the conveniently selected professionals along with a copy of the programme to issue their assessments. This process allowed us to identify errors in the initial design in order to redirect the design process of this programme until reaching its final version.

Prospectively, the intent of this study is the implementation of the programme in a real educational context, as well as the design of new proposals focused on other typologies of functional diversity. In this sense, the current work has been exclusively focused on students with intellectual functional diversity, yet a future perspective could be the design of intervention programmes for other types of functional diversity of our educational system. Apart from that, another possible ICT-related study covering educational inclusion could be focused on other curricular areas with the goal of contributing to the greatest possible number of knowledge subjects. To conclude, this intervention proposal is planned exclusively at the Primary Education stage; another future approach could tackle its implementation in other educational fields such as Early Years Education through psychomotor work or Secondary Education, making the convenient adaptations in a pedagogical level.

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