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GAMIFICATION AS A TOOL FOR ACQUISITION SOFT SKILLS IN THE DESIGN FIELD

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The current labour context is increasingly changing, driven by the continuous blooming of technological changes. So, the integration of recent graduates to the labour market, as new professionals, demand the acquisition of not only each field's specific Hard Skills, but also generic, transversal Soft Skills which might facilitate the adaptation of these professionals to future contexts, while enabling them to develop their work career in a responsible way, as well as increasing their entrepreneurial spirit. These abilities are especially relevant in the field of design engineering, as the idiosyncrasy of the discipline leads their practitioners to offering solutions to diverse problems society and users have. So their professional development is inextricably linked to social changes and society evolution.

In this way, in the "Sustainable Development Goal 4, Education 2030" (SDG4-Education 2030), regarding targets and commitments, the UNESCO defines the needs to emphasize the development of high-level cognitive and non-cognitive/transferable skills, such as problem solving, critical thinking, creativity, teamwork, communication skills or conflicts resolution, which can be applied across a wide range of occupational fields.

Therefore, the acquisition of these Soft Skills by design professionals can ease their adaptation to a novel future scenario and guarantee a prolonged professional development over time. So, not only learners should be provided with opportunities to update their skills continuously through lifelong learning, but it is also necessary to give the chance for active professionals to adapt to new contexts in the future.

This work presents an action proposal aimed to enhance the acquisition of Soft Skills by design professionals, in a playful way. So, a conceptual proposal of a methodology, based on the concept of Gamification, is suggested, where the degree of acquisition of some Soft Skills by the designer would be assessed.

To do so, a platform where sharing and assessing evidences is to be developed. And the incentive for the participation of both new graduates and professionals lies in the detection of their professional weaknesses (from the evidences' assessment) and the possibility of having a feedback consisting of professional recycling actions. The use of Smartphones becomes the vehicular platform for acquiring and assessing these transversal abilities, as these devices offer different technological possibilities for generating the designers' own evidences, by means of actions such as voice recording, video recording, image capturing, text recognition, etc. Once generated, the evidences would be assessed by using a co-evaluation system, based on a peer review process, where the evaluation of colleagues' work is presented as a part of a collaborative game and where the assessment process of peers' work can contribute ideas for improving personal Soft Skills. Furthermore, all this may end up in the generation of a community with common interests.

As a result, the suggested methodology can offer a useful tool for designers for continuously assessing the state of their Soft Skills, thus facilitating their progressive adaptation to the changes to their future professional contexts.

keywords: [soft skills](#), [game-based learning](#), [gamification](#), [project-based learning](#), [videos for learning](#).

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Abstract

The current labour context is increasingly changing, driven by the continuous blooming of technological changes. So, the integration of recent graduates to the labour market, as new professionals, demand the acquisition of not only each field's specific Hard Skills, but also generic, transversal Soft Skills which might facilitate the adaptation of these professionals to future contexts, while enabling them to develop their work career in a responsible way, as well as increasing their entrepreneurial spirit. These abilities are especially relevant in the field of design engineering, as the idiosyncrasy of the discipline leads their practitioners to offering solutions to diverse problems society and users have. So their professional development is inextricably linked to social changes and society evolution.

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As a result, the suggested methodology can offer a useful tool for designers for continuously assessing the state of their Soft Skills, thus facilitating their progressive adaptation to the changes to their future professional contexts.

Keywords: Soft skills, Game-based Learning, Gamification, Project-based Learning, Videos for Learning.

1 INTRODUCTION

The last decades of the 20th Century were characterized by a immutability of the labour context. That allowed professionals developing a range of specific skills throughout an initial educational/training period which would get steady along the major part of the professional time span. Apart from that, new knowledge to be added to those skills was, generally, only acquired from field experience and practice. Therefore, it was unusual to dismiss (above all, in short periods of time) that expertise background just because they had become obsolete or had to be updated to new, emerging, ones.

In contrast to that approach, 21st Century has brought a technological revolution by means of new digital communication systems, which has revolutionized the labour context. Currently, knowledge is no longer considered as a finite system and new tools and possibilities are continuously emerging. New professions appear, mainly as a response to these new scenarios in social communication and interaction, whereas others disappear, as they are considered as related to either obsolete or economically unsustainable activities.

Professionals need Hard Skills, specific to their labour fields, to properly develop their careers. They are quite stable in time, so their acquisition can be scheduled into a formative period (for instance, university degree studies) and they configure the core of each of the fields of study a prospective student could apply for. Nowadays, however, these Hard Skills are not enough for tackling professional practices; the labour context also asks for some other additional skills, Soft Skills, which are also considered as important.

The current labour context evolves fast, so both new professionals and future graduates are encouraged in acquiring these Soft Skills in order to be able to alter and adapt their professional abilities to the specific framework of each labour context. Furthermore, it is expected these new graduates to go through four or five significantly different contexts, so their professional career will depend on their ability for adapting to changes; for “learning to learn”.

Historically, UNESCO has periodically set various programmes with the aim of identifying the goals for a concrete period. In the “Sustainable Development Goal 4, Education 2030”, this institution identifies targets and commitments and emphasizes the development of high-level cognitive and non-cognitive/transferable skills, such as problem solving, critical thinking, creativity, teamwork, communication skills and conflict resolution, which can be used across a range of occupational fields. In the same way, UNESCO highlights the importance of promoting Lifelong Learning [1].

That changing context can also offer new business opportunities. Therefore, the ability for spotting where these chances are can ease the adaptation to future contexts, above all in case they are complex. In this way, it is convenient enhancing the entrepreneurial spirit of new professionals, by boosting the value of creativity as a means for either differentiating from competitors or opening business lines. Both possibilities may constitute a key positioning factor.

In the fields of Industrial/Product Design and Engineering, the ability for adapting to changes and the entrepreneurial spirit are linked to a responsible practice of the profession, as an intrinsic characteristic of the discipline consists of providing solutions to real society problems, taking minorities also into account. There are many initiatives in this way, which have led to concepts as Universal Design, Design for Sustainability (D4S), Circular Economy [2], Circular Design [3], etc.

This work presents an action proposal aimed to enhance the acquisition of Soft Skills by design professionals, in a playful way. To do so, diverse tools which can be used as platforms both for managing an assessment of the current state of the personal Soft Skills and developing activities that might led to their improvement have been studied. The idea is that recent graduates, as well as professionals, could detect their lacks and weaknesses, regarding this type of skills and be proposed varied actions in order to improve their situation.

That study includes an evaluation of some methodologies that might ease the dissemination of formative contents, the creation of evidences for assessing the evolution of Soft Skills acquisition and improvement, as well as the evaluation of these evidences themselves. During this work, it has also been kept in mind the tools and methodologies should have a ludic spirit capable of promoting a receptive mood for users to be eager to both test it and continue its use over time.

2 METHODOLOGY

2.1 Lifelong Learning and the update of Soft Skills

2.1.1 *Soft Skills*

Soft Skills can be defined as the abilities that are related to personal development. They are not only unlinked from a specific theme, field or discipline but also they are present in every academic and professional activity [4]. Therefore, they are taught transversally to the curriculum that corresponds with each field of study. However, Soft Skills monitoring and assessment is usually not as exhaustive as Hard Skills ones.

Paradoxically, in order to properly face the labour market, the prospective design engineers must have, apart from the specific skills belonging to this discipline, diverse abilities focusing on the human dimension of engineering, such as entrepreneurial mindset, teamwork and search for consensus, creative design, empathy, social responsibility or multidisciplinary thinking, amongst others [5]. In some cases, these Soft Skills can even have bigger relevance in the practice of the profession than the specific Hard Skills.

Perhaps, one of the most important Soft Skills students might acquire is the ability for “learning to learn”. This one would be the one helping them adapting to the different changes they would have to face in their future professional context [6], [7], [8]. That capability for self-learning might end up in a differentiating factor that would allow a professional to keep being competitive over time. Nevertheless, having acquired that skill is not enough; it has to be revised and renewed from time to time. And that means time and effort has to be put in on widening knowledge, bearing in mind informal learning spans tend to be longer than formal ones, as actions are not programmed as a whole. Therefore, time for self, permanent, learning has to be considered as an additional task of the career which has to be tackled periodically.

2.1.2 *Lifelong Learning*

In 1995, the “White Paper on Education and Training”, developed by the European Commission, the concept of “Formation throughout Life” or Lifelong Learning appeared for first time, in its initial challenges [9]. The Council of Europe Resolution on an renewed adult learning European Plan (2011/C 372/01), published on December 20, 2011, in the “Official Journal of the European Union”, suggests that in order to be able to get the goals marked in the 2020 Europe Strategy, grown-up people must be aware of learning is a permanent task they should be developing regularly during their lives. This way, the “Lifelong Learning Programme” (LLP) becomes an interesting initiative of the European Commission, which main objective is letting people participate in learning experiences they might find stimulating at any moment of their lives.

Various OECD reports show society is currently being characterized by continuous changes, complexity and interdependence between users and systems, because of the technological and social evolutions 21st Century has brought [10], [11]. Numerous international institutions, such as UNESCO or the European Union, are insisting on the idea of Lifelong Learning as a need to be able to adapt to successive changes, in their respective strategic educational plans [12].

Lifelong Learning could be, then, defined as a “global way of understanding learning, a principle in which the organization of a learning structure and contents is based; a project comprising all the formative possibilities on every field of knowledge, at any moment of a person’s life” [12]. This way of understanding learning throughout life overcomes the barriers of formal learning, thus including non-formal and informal learning, as well.

Nowadays, there is a large number of initiatives that can help getting knowledge in an informal way, as they can be the Massive Open Online Courses (MOOC); or their reduced version: Nano-MOOC (NOOC). In many cases, the quality of the contents of these courses is excellent and they allow takers acquire or enhance some professional abilities. However, sometimes time is the limiting factor to be able to follow these formative proposals, as professionals’ daily routines tend to be oversaturated with tasks to be done.

Therefore, it could be interesting studying and/or developing tools in order to ease the conciliation between permanent learning and the dedication to professional tasks, in this case, concerning to the design field. Within this context, informal formative initiatives with a playful background could be particularly attractive as a way of acquiring new skills, as well as of detecting formative lacks. The interest for steep in new knowledge has to start from the realization of having these lacks and the

willing of reversion of that situation, being conscious of this new knowledge can mean interesting professional chances in the future. The ludic approach would help effectively reach the previously stated conciliation.

2.2 Preliminary assessment of tools and methodologies

2.2.1 Gamification and Game-based Learning (GBL)

Gamification, as a concept, refers to the adoption of game-like principles when working outside of a gaming context. However, GBL simply means including games during the instruction [13]. When taken into the virtual field, GBL is also known as Digital Game-based Learning (DGBL).

A game can be described as an activity that is voluntary and enjoyable, separate from the real world, uncertain, unproductive (meaning the activity does not produce any goods of external value) and governed by rules [14]. This playful context, when applied to a formal field, like Design Engineering, can favour the motivation of the player (the designer, in this case) to carry out a concrete task. Various studies present Gamification as a teaching-learning methodology, derived from the Project-based Learning (PBL), which can foster creativity and motivation in students [15], [16], [17], [18]. Thus, GBL can be an effective way in which to motivate students and engage them in active learning experiences [19].

2.2.2 Videos for learning

The use of videos for developing short formative pills, which are distributed by means of diverse digital platforms, is revolutionizing the educational paradigm. In fact, these formative videos are the central core of MOOC, as they are the chosen channel for communicating the formative contents.

Screencasts and Video tutorials can be differentiated within Videos for learning methodology. Screencasts consist of a video of a screen direct capture, supported by a narrative, in which the operation of a procedure (usually a computer application) is explained [20]. In Video tutorials, situations with an educational purpose in which contents, techniques or procedures on a particular topic are transmitted, are recorded [21]. Despite their appropriateness depend on the type of content that is shown, both can be excellent resources for spreading formative contents (formal or informal). They can even be generated by students to create evidences of their knowledge or, in the case studied here, to show the degree of acquisition of a Soft Skill.

2.2.3 Skills' assessment methodology

Different approaches can be used for assessing skills [22]. In the fields of Industrial/Product Design and Engineering, where multidisciplinary collaborations are inherent, it is suitable basing the assessment of skills in peer-review processes. This approach not only tries to involve the individuals in the assessment of the results obtained by partners, but also seeks the assessment process to turn into a learning itself and a self-evaluation strategy for the generated evidences on a concrete skill. In this case, in order to have significant results, it is convenient that the assessment is carried out by, at least, three or four evaluators, so substantial variations on the assessment criteria can be corrected or balanced.

Apart from that, in order to ensure an objective peer-review process and that all assessors have developed their evaluations on the basis of the same standards, the use of rubrics would be suitable. It has to be noted that a rubric does not only consist of a table with diverse cells; it can show various appearances. Indeed, it would be interesting considering a pleasant, enjoyable, engaging interface for an application intended to carry out the assessment process, where it could be easy to visualize and understand the meaning of the indicators and evidences shown there, so their grading would be fast and simple.

3 DESIGN PROPOSAL

3.1 Preliminary study of tools

After the methodological revision, it can be interesting doing some similar process on the convenience of the diverse available platforms, in order to choose the most appropriate one for the development of the tool.

- **WEB sites.** This concept comprises various types of platforms, which offer different features, depending on the requirements of the site. Here, we can find platforms as Blogs (such as WordPress, Blogger, Tumblr, etc.), directed to the chronologic publication of contents by the user; or Web Sites fully developed by means of some kind of authoring software (i.e. Adobe Suite).
- **Social Networking software.** Here, a distinction between General-Interest and Own Social Networks can be established. In the first ones, the management of the platform is unattended and users' adoption is very easy. Depending on the chosen Social Network, the possibilities for interaction vary. Examples are Facebook or YouTube. In the second case, an Own Social Network can be created, where the possibilities of interaction between users can be designed and defined. Furthermore, they offer a greater control on users' subscriptions. Examples of these latter are Elgg or Ning.
- **Content Management Systems (CMS).** Online CMS and Hosting CMS can be differentiated here. Online ones (such as WIX or WordPress) allow for creating and editing web sites without needing an own hosting. They are usually free and easy to use, although they are more limited than Hosting CMS. On the other hand, Hosting CMS (Joomla, Drupal...) permit the creation and edition of own web sites with a high degree of control on the platform. They require of a hosting hiring and some specific knowledge on web programming.
- **Learning Content Management Systems (LCMS).** These platforms allow the creation of formative contents and the management of a high number of users easily. They also offer a great variety of interaction types between users. Examples are Moodle or Chamilo.
- **Massive Open Online Courses (MOOC).** They permit to create and manage formative contents addressed to a vast number of users. Contents are usually focused on the spreading of concepts by means of short formative videos. The interaction between users can also be managed and, sometimes, peer reviews can also been done. Examples are Miriada X, Udemy or Floqq.
- **APPS.** The more common ones are those developed for Android or iOS systems. Any kind of content can be created, allowing a high level of adaptation to any kind of device. They can also make use of several features of the smartphones or tablets where they are installed, such as the GPS, the use of either front or rear cameras, or any other available technologies. Their development entirely depends on programming, with the help of some sort of authoring software, such as Xamarin or Adobe PhoneGap.

These different kinds of platforms show diverse possibilities in users' interaction, bearing in mind this is one of the most significant aspects to be taken into account, according to the revised methodologies. Perhaps the most open option (although maybe the most complicatedly carried out) could be developing an own App. This way, apart from being able to generate and manage both contents and ways of interaction between users, some of the usual features in smartphones could also be used: GPS, cameras for video recording and/or picture taking, microphone for audio registering, etc.

3.2 Conceptual tool development

The App use ought to be easy for users. The aim is it to be useful as well as enjoyable. The actions to be completed must not require an exceedingly large amount of time. Reasonable time spans could vary from five (for the easiest ones) to thirty minutes (for the most complex operations).

When installing the App, the user will create an account which would be linked to an existing e-mail account. And when running it, the user will be asked about the possibility of creating a new group (in that case, an identification name will have to be introduced), of joining a concrete existing group (by means of the identification name of that group), or of randomly joining an existing group. This way, it

could be possible using the application from a single user that does not know the rest of the users that may interact with him/her to a group of users that want to work together.

The gaming background of the application would be structured into three sections, clearly defined and limited.

- **SECTION 1: ASSESSMENT OF OWN SOFT SKILLS.** Here, the user will be proposed a variety of tasks and activities, related with the design field, and according to the type of soft skill to be practised. The activities could be directly developed with the smartphone (for instance, recording an oral speech) or they could be carried out by means of external software and/or equipment followed by some sort of registration (picture taking or video recording with the smartphone) or files' uploading (for example, an infographic for communicating an idea using a graphic language).
- **SECTION 2: REVISION OF OTHERS' SOFT SKILLS.** In this section, the user will receive evidences generated by other users in the group. The user would have to review and assess them, numerically grading the indicators related to that evidence. These indicators will make up a full rubric that could be consulted. In case of doubts on the meaning of any of the indicators, the application would offer additional information on it, in order to ensure the evaluation is properly made. This way, this assessment will not only serve for grading the evidences generated by users in section 1, but also to reflect on the diverse skills, thus generating a self consciousness on the own skills which would complement the marks received by peers.
- **SECTION 3: IMPROVEMENT PROPOSALS.** In this third section, the user will receive improvement proposals with indications, suggestions or advices to be followed to correct usual mistakes. These proposals would contain voluntary tasks that could be carried out; in that case they would be assessed by the group peers, in a similar way as the activities in the first section. Fulfilling these voluntary tasks would grant the user with points that would increase his/her game level, according to their peer review results. This way, each user could focus, for example, on improving the soft skills with worse results, giving priority to the ones resulting the most interesting in each moment.

It has to be remembered that the main aim of the tool is promoting a professional retraining in a pleasant and engaging way; therefore all these activities have not to be considered as something obligatory. The gaming approach of the proposal, which can be adapted by each user from a competitive to a cooperative spirit, ought to be the motivation for developing activities: earning points, comparing ranks, etc. And, underlying to that, users would be working on diverse Soft Skills.

From that point of view, users will get points by participating in the three sections; these points would result in the completion of diverse levels, which would be reflected in each user's profile. Therefore, the interaction between users (from competitive to cooperative) would encourage the use of the application in order to achieve goals and level up. Levels would be growing independently in each section: "designer level" for section 1, "reviewer level" for section 2 and "improving interest" for section 3.

Apart from that, in order to enhance the game concept of the application, milestones would be needed for accessing upper levels. For instance, levelling up in section 1 or 2 would be subject to the fulfilment of a minimum number of actions in both sections. This way, a user can not only be a contributor or an assessor. Both activities have to be combined in order to make progress in the game. Finally, an action would be considered as assessed when, at least, three different users have reviewed them. Then, the user contributor of this activity will be informed on the assessment results.

The App user interface would be composed of various relevant display screens:

- **HOME.** When entering the application, a main screen will show, giving access to the each of the three sections, as subsets. This home display will also show new proposed challenges and detailed information on the user levelling in each section (Fig. 1).
- **OWN SOFT SKILLS' ASSESSMENT ('ASSESSMENT').** This screen would display diverse activities and how to publish them in the application: recording a short video, a podcast-type audio registration, an image capture, an external file, etc. Links to short videos with considerations on how to obtain good quality evidences will be accessible here, as well. Furthermore, the current level and the points needed for levelling up will also be shown.



Fig. 1. Home screen display proposal.

- **OTHERS' SOFT SKILLS REVISION ('REVISION')**. This screen would show activities generated by other users, ready to be assessed (Fig. 2). Before starting the evaluation, a short video will show up with considerations on how to assess properly the evidence. Indirectly, these considerations would act as suggestions for the assessor on how generate similar evidences to be well considered in the peer-review process. The indicators for assessment will change between revisions and assessors in order to avoid routine and cumbersome reviews. The assessment of a single task should not last for over five minutes; as a minimum of three revisions per activity is required, it is possible that each user would have to assess twice or three times the amount of tasks he/she generates.
- **IMPROVEMENT PROPOSALS ('IMPROVEMENT')**. This screen would display the ranking with the results obtained by the user in each of the Soft Skills he/she had worked in, ordered from worse to better grading. Videos with suggestions for improvement, as well as short activities (also to be assessed by the members of the group), for the skills that are not excellent considered, will be accessible here, as well.
- **MARKS**. This information will be displayed via the user's profile. Here, all the results obtained by the user will be shown, as well as the results of the rest of the members of the group in order to promote some sort of competitiveness between users. Indeed, here will be available the option for challenging other user to compete in a concrete Soft Skill; the winner of the challenge will be settled by the rest of the users of the group, by means of their assessment.

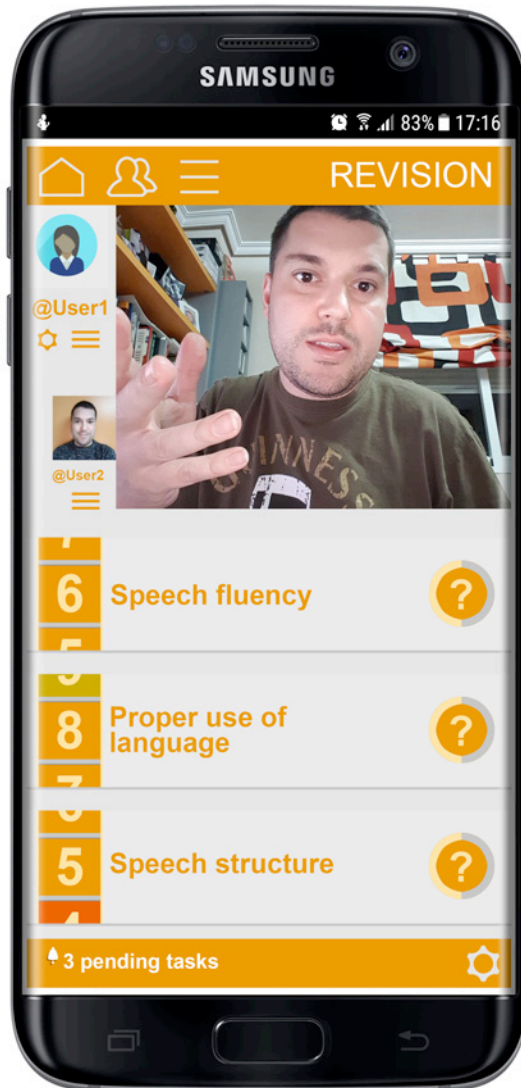


Fig. 2. Section 2 'Revision' screen design proposal.

4 RESULTS AND DISCUSSION

The proposed design is simple and attractive, so its use ought not to mean a problem for users. The proposed work flow focuses on the collaboration between users, either known or unknown, and the co-evaluation by means of the use of rubrics and peer-review assessments.

This proposal can also be an incentive in the assessment of the current state of Soft Skills in professionals or prospective graduates. The use of a playful, game-based, platform might encourage an early detection of professional lacks that could be corrected easily, and before generating an insuperable breach in capabilities and skills.

Furthermore, the application proposed here allows a relaxed and delocalized usage. Actions can be carried out at different moments during the day and, depending on the activity, in many cases without needing a computer to complete them. This permits to get a better and greater monitoring and persistence over time.

Usually, designers' agenda is tight, so the possibility of devoting short amounts of time between professional duties to detect weaknesses and to acquire and/or to improve skills can end up being fruitful, above all if these moments have been pleasant, enjoyable and engaging.

From the academic and educational points of view, this proposal can help to detect formative lacks during the university degrees' formative period. This way, it could be an interesting tool for students for implementing improvement actions that might ease their adaptation to the current real conditions of

the labour market, as well as to their future evolution. In this case, they could make the most of their formative stage and complement both the assessment and the improvement of their Soft Skills with the help and support of the teaching staff.

5 CONCLUSIONS

Flexibility for adapting to the conditions the future labour market will set can constitute an advantage for recent design graduates and for consolidated professionals who understand the importance of adapting to the market evolutions. From social and technological points of view, current labour needs probably will not match the ones existing in twenty years. This means that abilities and skills that nowadays open business possibilities for designers may not be interesting in the future.

Traditionally, an evolutionary step like that occurred with a generational succession of professionals, but the vertiginous rate of evolution of current technological systems, and the social relations between their users, will end up in the same generation of population going through diverse adaptation periods. As a result, the professionals capable of adapting to these changes will have more chances for succeeding.

Then, it is convenient students and professionals to be instilled the importance of Lifelong Learning and Soft Skills from the very formative levels. That way, the proposed application can be a ludic platform, a playful environment to favour design students and professionals acquiring and improving significant Soft Skills for a responsible practice of their career and an easy transition and adaptation to future contexts

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REFERENCES

- [1] UNESCO, *Education 2030. Incheon Declaration and Framework for Action for the implementation of Sustainable Development Goal 4 (SDG4-Education 2030)*, 2015. Retrieved from <http://unesdoc.unesco.org/images/0024/002456/245656E.pdf>
- [2] Yuan, Z., Bi, J., and Moriguchi, Y., "The circular economy: A new development strategy in China", *Journal of Industrial Ecology*, vol. 10, no. 1-2, pp. 4-8, 2006.
- [3] Romme, A. G. L., and Endenburg, G., "Construction principles and design rules in the case of circular design", *Organization science*, vol. 17, no. 2, pp. 287-297, 2006.
- [4] González, J., and Wagenaar, R. (Eds.). *Tuning educational structures in Europe. Final report. Phase one*. Bilbao: University of Deusto, 2003.
- [5] Miller, R. K. "Building on Math and Science The New Essential Skills for the 21st-Century Engineer Solving the problems of the 21st century will require that engineers have a new set of skills and mindsets", *Research-Technology Management*, vol. 60, no. 1, pp. 53-56, 2017.
- [6] Monereo, C., Pozo, J. L. and Castelló, M., "La enseñanza de estrategias de aprendizaje en el contexto escolar" in *Desarrollo psicológico y educación. Psicología de la educación escolar*, vol. 2 (Coll, C., Palacios, J. & Marchesi, A. Eds.), pp. 235-259, Madrid: Alianza, 1990.
- [7] Regalado, A., Peralta, E., and Báez, J. G., "Aprendizaje basado en competencias aplicado a una asignatura de transferencia de calor", *Formación universitaria*, vol. 4, no. 1, pp. 13-18, 2011.
- [8] Schmal, S., "Reflexiones en torno a un programa para la formación de competencias transversales en ingeniería", *Ciencia, docencia y tecnología*, vol. 44, pp. 239-262, 2012.
- [9] Comisión Europea, *White paper on education and training - TEACHING AND LEARNING - TOWARDS THE LEARNING SOCIETY*. Luxemburgo: Office for Official Publications of the European Communities, 1995.

- [10] OECD, *The definition and selection of key competences. Executive summary*. París: OECD Publishing, 2005.
- [11] OECD, *Panorama de la educación. Indicadores de la OCDE 2017, Informe español*. Madrid: Secretaría General Técnica, 2017.
- [12] Belando-Montoro, M. R., "Aprendizaje a lo largo de la vida. Concepto y componentes", *Revista Iberoamericana de Educación*, vol. 75, pp. 219-234, 2017.
- [13] Eames, J., EdSurge, Technology in school, *What Game-Based Learning Can Do for Student Achievement*, 2014. Retrieved from <https://www.edsurge.com/news/2014-05-28-what-game-based-learning-can-do-for-student-achievement>
- [14] Caillois, R., *Man, play, and games*. New York: Free Press, 1961.
- [15] Lehmann, M., Christensen, P., Du, X., and Thrane, M., "Problem-oriented and project-based learning (POPBL) as an innovative learning strategy for sustainable development in engineering education", *European Journal of Engineering Education*, vol. 33, no. 3, pp. 283-295, 2008.
- [16] Regalado, A., Cid, M. and Báez, J., "Problem based learning (PBL): Analisis of continuous stirred tank chemical reactors with a process control approach", *International Journal of Software Engineering & Applications*, vol. 1, no. 4, pp. 54-73, 2010.
- [17] Benítez, A. A., and García, M. L., "Un primer acercamiento al docente frente a una metodología basada en proyectos", *Formación universitaria*, vol. 6, no. 1, pp. 21-28, 2013.
- [18] González, C. S. G., "Estrategias para trabajar la creatividad en la Educación Superior: pensamiento de diseño, aprendizaje basado en juegos y en proyectos", *Revista de Educación a Distancia*, vol. 40, pp. 1-15, 2015.
- [19] García-García, C., Galán, J. and Izquierdo, R., "Application of Project Based Learning and Gamification methodologies as motivational tools for students. In *10th International Technology, Education and Development Conference*, INTED 2016, vol. 1, pp. 3241-3250, 2016. DOI: 10.21125/inted.2016.1755
- [20] Lloyd, S. A., and Robertson, C. L., "Screencast Tutorials Enhance Student Learning of Statistics", *Teaching of Psychology*, vol. 39, no. 1, pp. 67-71, 2012.
- [21] Galán, J., García-García, C., Díaz, D., Muñoz, A., and Pesudo, M.C., "Use of videos and graphic tablets in the teaching-learning process for handmade rendering in the degree in industrial design and product development engineering", in *8th International Technology, Education and Development Conference, INTED 2014*. vol. 1, pp. 6860-6868, 2014.
- [22] Griffin, P., and Care, E. (Eds.), *Assessment and teaching of 21st century skills: Methods and approach*. Dordrecht: Springer Netherlands, 2014.