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PRELIMINAR STUDY ON THE APPLICATION OF DIFFERENT COMMUNICATION TECHNIQUES FOR CIRCULAR DESIGNS

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An effective Circular Economy strategy comprises demonstrate practical application, by including real life examples and emphasizing with data and facts. The communication strategy is addressed during the design process and designers have to think about the product/service and about how communicating it. To reach a broader impact, techniques like creative storytelling or educational messages are needed.

This work aims to know the ease or difficulty for industrial design engineering students in the application of these techniques to effectively communicate the advantages of a design based in the Circular Economy. To address this, a workshop has been done to explain basic notions about circular economy and consumptions patterns and trends. Then, communication techniques were explained, using examples. The workshop proceeded asking the students to apply these techniques for emphasizing the advantages of a circular product, working in groups.

Finally, a questionnaire was passed to evaluate their opinion about the communication techniques applied. At the end, a debate was conducted about their perception about the importance of communication in designs based in circular economy.

Keywords: *Circular Design; Circular Economy Communication Canvas; Storyboard; Teaching experience*

ESTUDIO PRELIMINAR DE LA APLICACIÓN DE VARIAS TÉCNICAS DE COMUNICACIÓN EN DISEÑOS CIRCULARES

Una estrategia de Economía Circular efectiva requiere mostrar aplicación práctica, incluyendo ejemplos de la vida real y enfatizando con datos y hechos. La estrategia de comunicación se aborda durante el proceso de diseño y los diseñadores deben pensar en el producto/servicio y en cómo comunicarlo. Para conseguir un mayor impacto, es necesaria la aplicación de técnicas como narración creativa de historias o los mensajes educativos.

Este trabajo pretende conocer la facilidad o dificultad que tienen estudiantes de ingeniería en diseño industrial en aplicar estas técnicas para comunicar de forma efectiva las ventajas de un diseño basado en la economía circular. Para ello, se ha programado un taller en el que se introdujo la economía circular y los patrones de consumo y tendencias de mercado relacionados con ésta. Después se les explicaron las técnicas de comunicación, mostrando un ejemplo. A continuación, se les ha pedido que apliquen, trabajando en grupo, cada técnica de comunicación para enfatizar las ventajas de un producto circular.

Finalmente, se les pasó un cuestionario de evaluación sobre su opinión acerca de las técnicas de comunicación aplicadas. También se debatió sobre su percepción en cuanto a la importancia de la comunicación en diseños basados en la economía circular.

Palabras clave: *Diseño Circular; Canvas de Comunicación de Economía Circular; Storyboard; Experiencia de enseñanza*

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1. Introduction

The last 40 years' linear take-make-consume-dispose economic model creates fundamental challenges (Rockström et al., 2009). In a circular model, waste and pollution are designed out, products and materials are kept in use and values sustained for as long as possible – lowering the stress on natural systems (Ellen McArthur, 2012). The European KATCH_e project (Knowledge Alliance on Product-Service Development towards Circular Economy and Sustainability in Higher Education) in <http://www.katche.eu/es/>, develops training materials on CE, including both theoretical background materials and tools for practical implementation of CE solutions in organizations.

An effective Circular Economy strategy comprises demonstrate practical application, by including real life examples and emphasizing with data and facts. The communication strategy is addressed during the design process and designers have to think about the product/service and about how communicating it.

Circular Economy (CE) is a relatively new concept, so most instruments that can be used for communication are still under development or adaptation. Indeed, language to define CE is still confusing, so there is a need to harmonize the concept. The objectives of CE communication are (Perella, 2015):

- To demonstrate practical application of CE
- To increase awareness of the agenda
- To change perceptions

Strong communication to engage all stakeholders is crucial for the success of circular economy (WBCSD, 2016). An effective Circular Economy strategy comprises demonstrate practical application, by including real life examples and emphasizing with data and facts. The communication strategy is addressed during the design process and designers have to think about the product/service and about how communicating it. To reach a broader impact, techniques like creative storytelling or educational messages are needed. Communication strategies should involve showing leasing, sharing, no waste options in fashion magazines, health magazines, influencers' blogs, etc. (Stahel, 2016). This will raise awareness about all stakeholders' responsibility about the products and services lives

The British Standards Institute published a guidance document for implementing the principles of the circular economy in organizations: The British Standard 8001 (BS, 2017) includes a marketing section.

Marketing is a very important element for circular economy in practice, since ensuring that new products and services succeed in the market implies that they should be appealing to customers. Product reuse, refurbishment and remanufacturing and moving from products to services are solutions aligned with circularity that may face resistance from the customers' side, as they may require a new mind-set, a new way of analysing the cost structure and new routines. The British Standard 8001:2017 states that marketing has to be relevant at three customer decision stages: (1) acquisition of a product, whole, in parts or pre-used; (2) adoption of a service model and (3) choice of end of use collection scheme. The success in the implementation of circular economy depends on the ability to trigger a different behaviour in customers.

This work aims to know the ease or difficulty for industrial design engineering students in the

application of these techniques to effectively communicate the advantages of a design based in the Circular Economy.

2. Guidelines and techniques for communicating circularity

This section describes some techniques to communicate circularity. These include methods that can be applied to communicate other issues. There are specific tools and metrics that also communicate circularity (Ellen McArthur Foundation, 2015; Pauliuk, 2018; Saidani et al., 2018; Smol et al., 2018; Janik & Ryszko, 2017), but these are not the object of this study. The methods selected for the preliminar study are: Circular Economy Communication Canvas; Storyboard and Educational Messages.

2.1 Circular Economy Communication Canvas

A study identifies eight key elements for effective communication of circular economy in the fashion sector (Han et al., 2017). The representation of these elements follows the traditional canvas model format, but adapted to the development of communication strategies. The final aim is to facilitate decision making of all stakeholders. Figure 1 shows the eight elements to build the Communication Canvas.

Figure 1: Circular Economy Communication Canvas components. Adapted from Han et al. (2017)

CIRCULAR ECONOMY COMMUNICATION CANVAS	
<p>Market research Trends, competitor analysis, current issues in industry.</p>	<p>Target audience Clear final user profile: income, interests, motivations, lifestyle choices</p>
<p>Coherence values Clear communication of core values and followed through the supply chain.</p>	<p>Visually engaging Use of creative, short, unique text, images and symbols</p>
<p>Clear message Why is important what the company is doing? Why users' should stand for this? Communicate with transparency and authenticity how the supply chain follows stands for it</p>	<p>Multichannel Combine online and offline channels to reach a wide audience Survey research to know preferences</p>
<p>Compelling products Attractive products that compete with the style, design and prices of linear ones</p>	<p>Feedback loops Creating feedback loops, collecting recommendations from all stakeholders across the supply chain.</p>

Canvas template represents in an easier way of all the elements that take part in the CE communication. Each section in the Canvas template can include drawings, icons and other kind of symbols. All the stakeholders, thus encouraging them to participate and propose new ideas, can understand it with few efforts.

2.2 Creative narration: storytelling and storyboard

Creating CE business opportunities implies the understanding of stakeholders' needs and limitations; flows of materials and product and services logistics. Circular products/services must satisfy the end user while creating value for all stakeholders and reducing negative impact for the environment. Creating stories during the design process is a way to represent

future, non-existing scenarios in a visual and simple and quick manner (Gascá & Zaragoza, 2014). These future proposed scenarios associated to the new ideas about circular products/services can be tested with all stakeholders through as many iterations as needed. Storytelling can also be used at the end of the design process to launch the product/service to market.

Narration consists of telling a story by means of words and images that connect and emphasize with the receivers. It is an ancient technique very applied nowadays. The aim is that the information has a significant effect on the users.

Narration do not need to tell the users how circular a product or service is, but it also might sell them how good the experience would be, putting the emphasis on different advantages. A good narration may even make users question their values and actual decisions. The next steps to elaborate a storytelling are based on the websites (<https://www.circulardesignguide.com/post/narrative>; <https://medium.com/ideo-stories/how-to-tell-stories-that-influence-people-and-inspire-action-bd1db98d1a01>):

- Think about the emotional qualities you want to evoke for users/stakeholders. Which is the main idea you want them to retain at the end?
- Learn about your audience.
 - Are they sceptical about environment and sustainability? Are they concerned? Are they wishing to change the world? If you want to persuade them with a new idea, you will need to help them imagine how good that would be for the world.
 - What is important for your audience? What do they wish/like? What do they fear? Take notice of this, emphasize with their emotions and think about how to stimulate and reveal those emotions in the story.
- Create a storyboard. Try to answer the following questions to define the main elements.
 - Does it start with a big challenge? With a common situation in a person's life? If there are characters: who they are? How is their routine and lifestyle? How many characters are needed?
 - In which context is the challenge or need happening? (place, moment)
 - Which are the consequences of this unsolved challenge/need? What would the audience like to happen? Which is the reason of that wish? Which are the barriers to get it?
 - What is our innovation? Why is important? What insights brought you to this solution? How will this change your users' lives in some way? How will they feel with this new product/service? Which emotions should be highlighted?
- Construct the story creating a 'through-line' to it and placing all the components. Some tips to create the storyline are:
 - Think carefully about which words to use
 - Use specific, simple and emphatic language
 - If possible, add humour, be original. It can include a call to action (see later)
 - Choose scenarios and define details that help the audience to identify themselves with the story.
 - Use numbers. Which are the most important numbers to depict the economic, environmental and social impacts of this product/service? If you do not have this data, it is a good idea to estimate them (saving energy, tons of raw material saved, tons of waste recovered, number of Jobs created, saving space, saving time, etc.)
 - Think about the images that will go with the story and create a draft storyboard.
- Test it. Prototyping and testing is very important and several iterations are needed.

Draft your story in different ways and show them to different people. Then, get their feedback and use it

- Implement and disseminate it.

There are several storytelling examples related to CE. Two of them are:

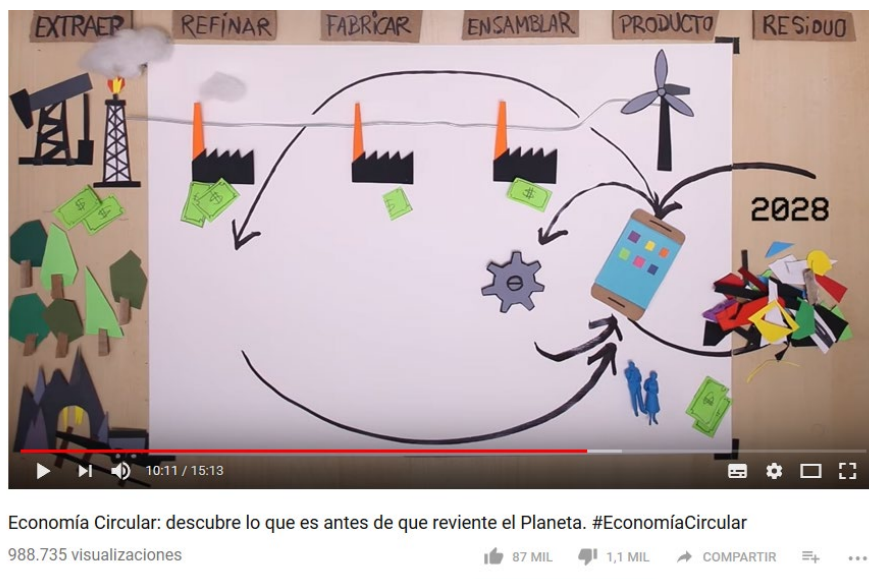
- Veolia: <https://www.youtube.com/watch?v=30MOeH3CGsQ>
- Ikea save furniture: <https://www.youtube.com/watch?v=WNHyJWR27yg>

2.3 Educational messages

For an effective change to CE it is needed that, not only do designers, architects and business people get knowledge and training about it; the whole society needs to understand that CE is an alternative sustainable way. Educational messages have to use a simple terminology and communicate the benefits related to business, environment and society. Myths that might be anchored in people's mind, as "taking care of environment is against economy" must be erased. Changing behaviour is central.

COTEC, a Spanish Agency for Innovation launched an informative video explaining the Circular Economy in March 2017 (Figure 2). This video has almost a million visualizations in April of 2018 and more than 4000 comments. It is very visual, dynamic, and uses data to emphasize the relevance of CE (COTEC, 2017).

Figure 2: Napsnot of COTEC video about Circular Economy
(<https://www.youtube.com/watch?v=Lc4-2cVKxp0>)



3. Workshop with engineering industrial design students

To address this, a workshop has been done to explain basic notions about circular economy and consumptions patterns and trends. Twelve students from the Bachelor in Engineering in Industrial Design participated. The participants already knew what circular economy and associated design strategies are. The duration of the workshop was 5 hours, structured in the following contents (Figure 3):

- The marketing section of the British Standard 8001
- The Circular Economy Communication Canvas

- Narration techniques: storyboard and storytelling
- Educational messages
- Calls for action, cognitive dissonance, infographics
- Specific tools for circular economy

Figure 3. Picture from the workshop



The communication techniques were explained using examples. The workshop proceeded asking the students to apply the Canvas and the storyboard for emphasizing the advantages of a circular product, working in groups.

The first assignment was to fill in a Communication Canvas for a real case (Figure 5). The case was the product “Cabinet becomes sofa”, from Gispen furniture company, a in the Netherlands that follows the Circular Economy (<https://www.gispen.com/en/circular-economy/remade-kast-page>). The case selected for the workshop are high tambour door cabinets in offices, nowadays an obsolete product due to digitalization. Gispen proposes and manufactures new applications from these cabinets (Figure 4). One of them are sofas, but they propose more options, such as workstations, lockers, etc. So, the company collects old cabinets and remade them into new products. The second assignment was to think of a creative story following the steps proposed in section 2 for the same case. Students worked together in teams of four for these tasks.

Figure 4. Remade products from cabinets (Gispen)



Figure 5. Selection of ideas obtained for communicating circularity with Canvas

<p>Clear message section</p> <p>X% of the products supplied consist of reuse of existing products, semi-finished products and materials. This may involve new products as well as products REVIVED by Gispén and REMADE by GISPEN. We have return agreements of X% of the Gispén collection. Eliminate the X% of waste by closing the circles. X% of our suppliers meet our circular purchase conditions. We achieved a reduction of X% of CO₂ by closing the circles for our customers. Indicator of Circularity of Materials (MCI) > X% (at the level of company, Ellen MacArthur Foundation indicator).</p>	<p>Feedback loops section</p> <p>Small surveys</p> <p>Transparency with the user</p> <p>Perform a mini interview where the user provides improvements.</p> <p>Comments section.</p> <p>Offer users of the nearby population the possibility of interacting with the products in a physical store.</p>
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4. Opinion of students about the techniques to communicate product circularity

Finally, a questionnaire was passed to evaluate their opinion about the communication techniques applied. At the end, a debate was conducted to ask their perception about the importance of communication in designs based in circular economy. The questions were:

- Which content did you find more interesting?
- Which content did you find less interesting?
- Which content did you find confusing?
- How did you like the assignments?
- Suggestions for improvement

Since all the items are open answer questions and the number of participants is low, the treatment of the questions is qualitative (Figure 6). Ten persons filled-in the questionnaires. The arrows show the number of persons that states the same answer.

4.1 Opinion about the communication of circularity in overall

After the workshop, participants say that they see the value of communication, and of these techniques in particular, in changing the perception of products focused on the CE. They have become more aware about how to involve the user to participate and value the principles of the CE. Also, they have learnt how to communicate and educate the user by applying certain strategies. They claim that the most interesting thing has been to see what can be achieved, or how deeply and how well you can explain these terms to any audience with an educational narration and graphic messages. Also, they appreciate how the use of specific data help to understand why a product follows circular economy principles. Finally, they also indicate that perhaps the most confusing was to grasp the ultimate goal of what to do in the assignments at first sight.

4.2 Opinion about the methods and the assignment

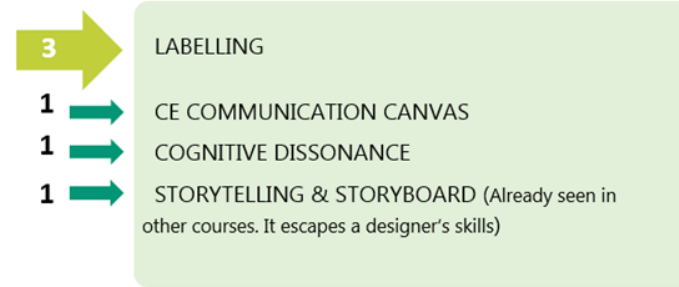
The methods have lead the participants to define how to communicate to users the benefits of investing in a circular product, in a visual and well-understood manner.

Figure 6. Opinion questionnaire answers

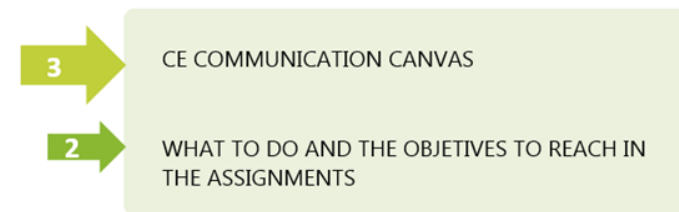
Which content did you find more interesting?



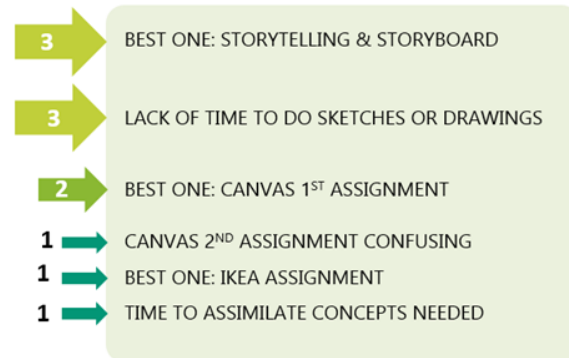
Which content did you find less interesting?



Which content did you find confusing?



How did you like the assignments?



Suggestions for improvement:

- TOO MUCH INFO TO ASSIMILATE IN SHORT TIME
- MORE TIME TO THINK ABOUT THE ASSESSMENTS
- MORE DEBATES/DISCUSSIONS
- MC INDICATOR EXAMPLE IN CLASS
- BETTER INSTRUCTIONS FOR ASSESSMENTS
- MORE PRACTICAL EXAMPLES, REAL LIFE CASES
- MAKE CANVAS EXAMPLE MORE GENERAL IN ORDER TO DEDICATE MORE TIME TO STORYBOARD

The opinions collected about the application of the Circular Economy Communication Canvas are diverse. The balance falls in favour of the participants that claim that this method is not very clear and somehow confusing and difficult to apply. Others claim that would think about this scheme during the product design and appreciate the value of thinking to whom is directed the product, what do we want to show with it, etc. This difficulty may lack in the fact that for students is difficult to think about all the questions if they are not involved in a real case. Therefore, they need to make assumptions. Any case, showing an example would improve the teaching of this method. Those who have easily made assumptions, appreciate the high value of this Canvas template for communicating product circularity.

Concerning the storyboard technique, there is a general agreement that the technique is interesting and useful for explaining your product in a more visual and original way. Participants note that this tool makes you put yourself in the shoes of the user and empathize with him in order to sell a product. A participant expresses that “it is very practical because it is very important to know how to reach the user and make him see clearly what we want to transmit”. Another one says that, “it is interesting, but perhaps the realization of storyboard escape a bit of our skills as product designers”. With the available time in this preliminary experience, more time would have been needed to finish some drawing or sketches.

5. Discussion and conclusions

It is observed that there is interest in the general techniques to communicate and that the examples shown have allowed students to understand the possibilities of these techniques. Also, curiosity about the circular economy has been provoked. Part of the time devoted to the tasks has been to better understand the type of product. Circular Communication Canvas has shown to be the method for which more questions have raised during the assignment. As teachers we have found that learning can be improved by including more detailed instructions for some techniques and response templates.

From the results and opinions obtained in this preliminary experience, we can extract several ideas for the teaching of these techniques in engineering students in industrial design:

- The organization of students in groups seems adequate to apply the techniques to a case, since it encourages reflection and deep discussion of ideas.
- The understanding of the techniques is complex, since there is a certain distance between the techniques and competences of the product designers. For example, even if they get good ideas for the storyboard, they find it difficult to develop narratives.
- Explain in more detail what to do in each step of the techniques. Although when they found not contents or terms difficult to understand, they would need more explanations to grasp the ultimate goal of what to do in the assignments at first sight.
- Allow enough time to make the storyboard. Making drawings takes much more time than the time used in the workshop.
- Ask students, in a previous session, to analyze products that already use the circular economy.

The students have understood the possibilities of communicating the advantages of a circular design using techniques such as the Circular Economy Communication Canvas and the narrations. They have also realized, when applying them, that as designers, they lack skills for adequate communication. From the preliminary results observed, it can be deduced that, although they understand the techniques, in order to obtain a greater advantage, it could be convenient to do it in collaboration with other profiles.

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