Terms and meanings of "participation" in product design: From "user involvement" to "co-design"

Lucía Sánchez de la Guía, Marina Puyuelo Cazorla & Blanca de-Miguel-Molina

Published online: 06 Sep 2017.

Submit your article to this journal

View related articles

View Crossmark data

DESIGN FOR NEXT
EAD12-ROME

Design for Next
12th EAD Conference
Sapienza University of Rome
12-14 April 2017

Terms and meanings of "participation" in product design: From "user involvement" to "co-design"

Lucía Sánchez de la Guía[a], Marina Puyuelo Cazorla[a], Blanca de-Miguel-Molina[b*]

[a]School of Design Engineering, Universitat Politècnica de València
[c]Department of Management, Universitat Politècnica de València
*Corresponding author e-mail: mapuca@ega.upv.es

Abstract: Design thinking with the users, is a new way to understand and create new products and services. This new conception of design is leading to new larger ideas and more complex methods in order to improve this process. The new participatory methods, generates new design concepts and also, different experiences in the project. Since the development of technologies and social media the power of collaboration has become a way of thinking, which is changing the landscape of design. Participation of users and customers in the development of products and services started to be an important issue in Design Management literature in the last years. This paper presents the evolution of the terms related to participation, their use and interrelations. We consider that they are relevant nowadays, for the interpretation and communication of the user's role in the design as developers of relevant innovations in products and processes.

Keywords: Co-design, Co-creation, Collaboration Design, Design Thinking, Participatory Design

1. Introduction

Since the development of technologies and social media the power of collaboration has become a way of thinking, which is changing the landscape of design. Participation of users and customers in the development of products and services started to be an important issue in Design Management literature in the last years. Important for this new culture, as well as our way of work, are the awesome development of skills and relationships, given by the access to communication and the digital tools that are today, fixed with our society.

Participatory design describes an approach that contributes to design processes which attempts to involve all stakeholders (employees, partners, customers, citizens, end users). The aim is to share the design in order to improve processes and procedures, and get a better understanding of needs and usability. Often we can find a "Co" in the headlines that is associated with sharing in an appealing way: Some of these "new" meanings have to do only with feedback from customers, those denoting

customization, and others expressing innovation. It´s interesting to observe the evolution of these concepts from the terms firstly used "user involvement" in the latest 80's, to the most employed nowadays "co-creation", "user innovation" and "co-design".

Design thinking with the users, is a new way to understand and create new products and services. This new conception of design is leading to new larger ideas and more complex methods, in order to improve this process. The new participatory methods generate new design concepts and also different experiences in the project. As a consequence of this novelty, it is necessary to get deeper knowledge on this culture of design where this field is becoming more and more important. As some authors indicate (Harhoff (2003), von Hippel (2003), users have been identified as developers of relevant innovations in products and processes. Other authors, pointed out, that users participate because they are interested in the "do it yourself" concept and the development of specific products, which could satisfy their own needs (Franke (2010). This paper offers an overview of the different approaches made during the last two decades, around the participation in the design process. We discuss these affirmations, studying these terms about participation in design that have been results of the marketing strategies and needs of the contemporary society. Some studies affirm that a good comprehension of the design thinking and the users' needs will bring to customer's satisfaction (Füller (2009), Zhao and Dholakia (2009), Hawk and Aldag (1990).We argue that the definition of these terms will help to get effective communication between all the participants and will contribute to innovative designs.

Relevance: Design for next thinking is absolutely linked to participatory design concepts and it is necessary to clarify some terms about it, because co-design, collaborative design, co-create are current terms, often used in the same way.

This paper presents a literature review related to customers' participation, including the different keywords that have been used to refer to this participation, and the reasons obtained from previous studies in relation to Strategy, Business Models and customers' satisfaction. The work is structured as follows: first in section 2, we explain the method to get these words that are the data, core of this study. In section 3, we present a selection of Keywords and terms that have been used in the last two decades, related to user/customer participation in design. Later in section 4, we summarize the definitions of a selection of these terms, supported by more authors. We discuss in section 5, the evolution of these terms and the interrelations of the different words and meanings. Finally, we include some conclusions about the relevance of these words on the interpretation and communication of the user's role in the design.

2. Methods and data source

2.1 Obtaining papers to be analysed

In this section we present all the different keywords that literature has used to refer to participation of users/customers in design of products and services.

In order to obtain the papers, we have made some queries in the Scopus database. For this purpose, we use the process followed by de-Miguel-Molina et al. (2015), who undertake a literature review about user innovation. From a main keyword, they extend the query including more terms obtained through Bibliometric method. We use the first results to obtain more keywords to start again our query, to which we add some more terms that we found in the reading of the different papers. The final query we made, by 3rd February 2016, included the following keywords:

TS=("end user innovat*" OR "user driven innovat*" OR "user innovat*" OR "customer innovat*" OR "consumer innovat*" OR "lay user innovat*" OR "user led innovat*" OR "lead user innovat*" OR "user entrepreneurship" OR "community based innovat*" OR "collaborative innovat*" OR "living lab" OR "user co-creation" OR "user co-design" OR "user co-innovat*" OR "customer centered innovat*" OR "co-creation" OR "co-design" OR "customer co-innovat*" OR "consumer co-creation" OR "consumer co-design" OR "consumer co-innovat*" OR "co-experience" OR "value co-creation" OR "user experience" OR "product experience" OR "co-production" OR "collective creativity" OR "open design" OR "user-centred design" OR "interaction design" OR "customer feedback" OR "collaborative design" OR "participatory action research" OR "user involvement" OR "empathic design" OR "participatory design" OR "universal design" OR "prototypes design" OR "design creativity" OR "lead users")

The results we obtained for papers in English were 20,511. Then, we selected only those included in the subject Management & Business, which gave a total of 2,818 results. We download these results in a text file and we imported them to the software for Tech-mining VantagePoint (The Search Technology). This software allows working with search results from text databases and helps when getting thousands of records.

The next step was to clean the data and get into a consistent set, combining the terms we wanted to analyze as a group. We considered then to observe: a) all the keywords, which refer to participation of customers/users, and the first year in which every of them was used; b) co-occurrence of keywords related to participation with those related to Strategy and Business models.

3. Keywords related to user/customer participation in product/service design

This part of the study includes the results obtained from the literature review explained previously. All these terms have been organized in a VantagePoint table, which shows their evolution in the time. We can observe the frequency each combination of terms to express user / customer participation have been used in literature in each year, since 1987 (Figures 1 and 2).

Figures 1 and 2 present all the keywords we found related to customer participation, which in total are 73. We represent all the keywords using a bubble chart where data points are shown with bubbles. This offers an additional dimension of the data represented in the size of the bubbles. Different bubble sizes are useful to visually emphasize specific values.

Among these keywords, we can detect those that express only feedback from customers, those denoting customization, and others expressing innovation. From these figures, we can observe that this field is very recent, with few results for years 1987 to 1998, as we can see in Figure 1. Moreover, in this period the term most used was "user involvement", which appears first in 1988 in Palvia and Palvia's work (1988). This analysis was made with results from Scopus; however, the same query and cleaning with Web of Science results gave us the first year for "user involvement" in 1980, in the work by Schonberger (1980).

In the second period, shown in Figure 2, the most used terms are "co-creation" and "user innovation". Concerning the term design, in the first period it only appears in the keyword "participatory design". In the second period the term appears in the keywords "co-design", "collaborative design", "collaborative product design", "participatory design", "user design", and "user-centered design". All in all, the use of the term is scarce in both periods but, as we told before, it is a recent field.

Nevertheless, from 2008, the numerous appearances of key related terms indicate that the topic of the integration of the users, it has spread.
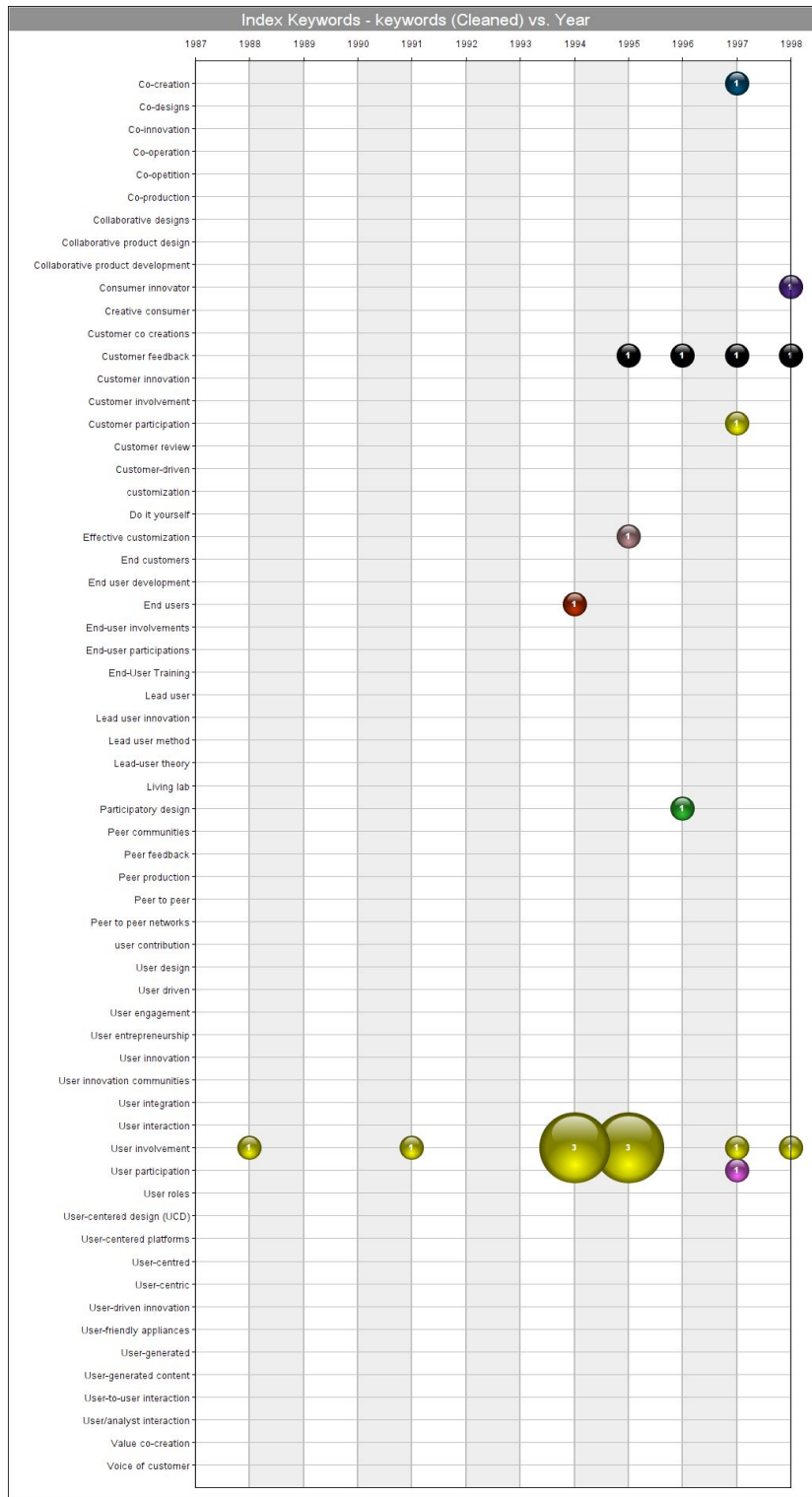
Fig. 1. Evolution of keywords related to Codesign 1987-1998 employed on papers/articles from the Web of Science. Source: own elaboration. Cleaning with VantagePoint software
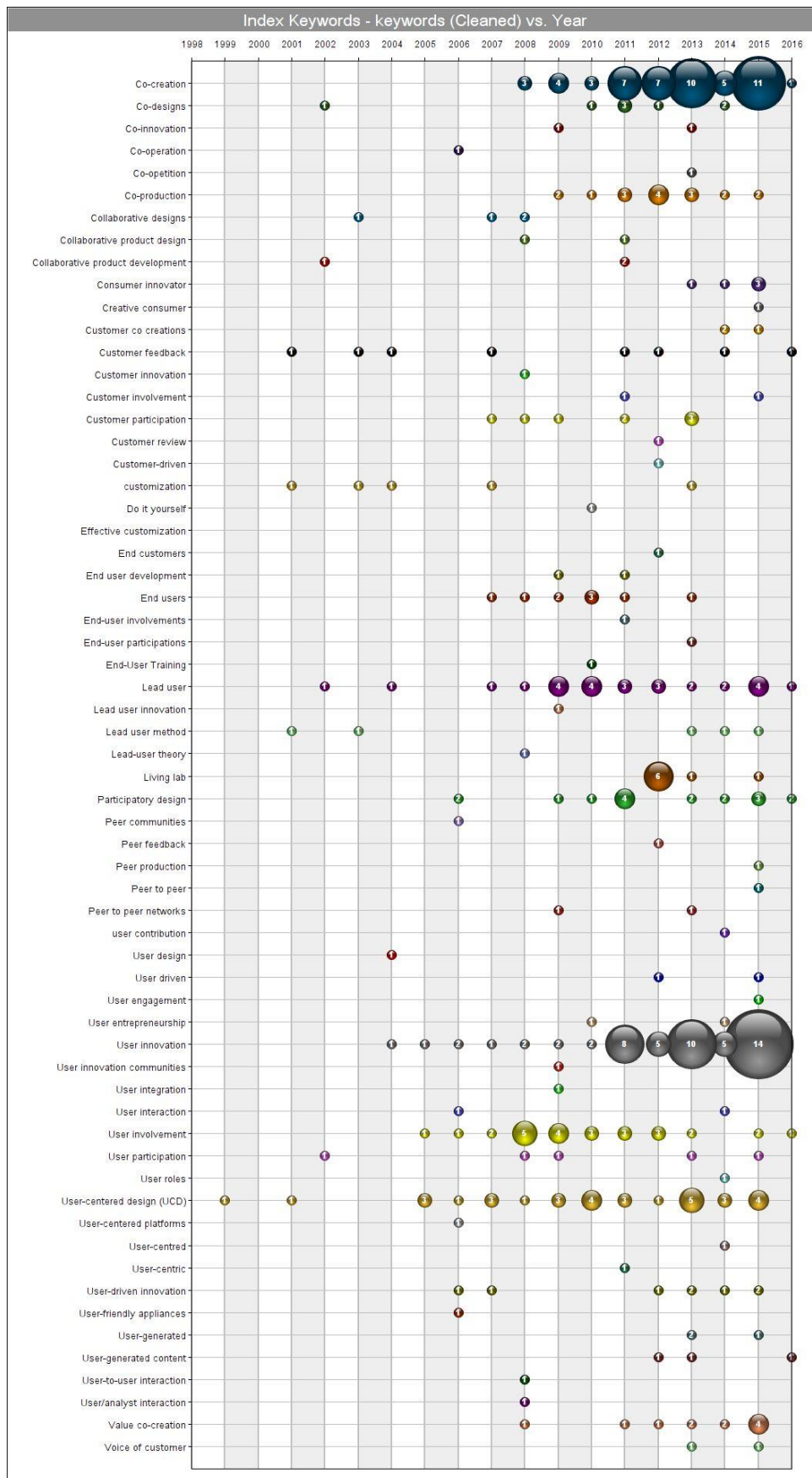
Fig. 2. Evolution of keywords related to Codesign 1998-2016 employed on papers/articles from the Web of Science Source: own elaboration. Cleaned with VantagePoint software

4. Definitions for concepts related to customer participation

Terminology referring participation also presents its own evolution. Sanders et al. (2014) indicate that the most recent term of co-creation/co-design, has replaced the previous term of participatory design.

This part of the study offers an overview of the different approaches in the last two decades, around the participation in the design process. Once we have presented all the terms that refer to participation of customers, our next step is to define the most important terms.

For this purpose, we have included definition for the 13 terms or concepts more used on the Figures 1 and 2. To select them basically we have taken the terms or couple of words, that have had three or more uses per year. The authors who defined them are referenced, and also the applications and how these authors have introduced the terms.

The following concepts are presented in chronological order.

4.1 Participatory design

Sanders et al. (1995) indicate that in participatory design, users and other stakeholders become direct participants in the design and development of systems, products, and spaces. In this way, they know their experiences and participate in the design.

4.2. User innovation

Von Hippel et al. (1999) showed in their analysis of different industries, that many innovations were developed by users, rather than by the manufacturers. They pointed out that when a firm wants to generate new ideas, the team in charge of this would usually collect information from users. For this purpose, the will use different methods like focus groups. Some of the ideas from users might be an innovative product for the firm. Therefore, as De Jong and von Hippel (2008) refer, user innovations are those "innovations developed by end users, rather than by producers".

4.3. End users

Harhoff et al. (2003) show how empirical studies of innovation have found that end users frequently develop important product and process innovations. End users can help to obtain a major benefit related to the innovation processes. Authors argument that when users are willing to freely diffuse information about their innovations, the users needs result in an attractive proposition for the overall economy. The paper talks about how end users provide value for companies and society, so it is interesting to promote the participation and involvement with them promoting the development, free revealing, and widespread utilization of user innovations.

4.4. User-centred design

Tramullas (2003), define user centred design like a process with techniques focused on the requirements of users. This article is focused on the creation of products and service of digital information. User centred design has been introduced in the Information sciences especially in the field of digital libraries. The standard ISO allow controlled the methods and the usability during the

design process for interactive systems. Author proposes two main stages, which identifies as system definition and detailed design and implementation, respectively.

4.5. Co- experience

Battarbee (2003) defined co-experience as "the experience that users themselves create together in social interaction".

They pint out that co-experience is a relevant issue in the field of Human-Computer Interaction (HCI). To illustrate user experience, author presents two examples of stories that imply re-appropriating technology for social use. Through the development of personal communication technologies and digital media in affordable consumer products, ordinary people can take over these technologies for their own purposes. For example, users have the opportunity to create relevant experiences together with their family and friends.

4.6. Co-creation

Prahalad and Ramaswamy (2004) define co-creation as "creating an experience environment in which consumers can have active dialogue and co-construct personalized experiences; product may be the same (e.g., Lego Mind storms) but customers can construct different experiences". They also indicate "co-creation is about joint creation of value by the company and the customer. It is not the firm trying to please the customer". They also talk about the dialog like something basic in the creation of value.

They studied, with some examples, how famous companies incorporate and use co-creation and how the user is willing to do that. Also, they found health care themes where the patient is involved. In their work they talk about how firms interfered with customers and they feel loyalty, thanks to the change in points of view to create new products and services.

4.7. Value co-creation

Prahalad and Ramasway (2004). The meaning of value and the process of value creation are rapidly shifting from a product- and firm- centric view to personalized consumer experiences.   Authors propose the view of value co-creating like something that consumers are increasingly, because they take place in informed, networked, empowered and are active users.

4.8. User involvement

Lettle (2007) referred to user involvement to those users "that play an active role as inventors and co-developers". Kujala (2010) involves end-users as a research in the design activities that can have diverse positive effects: on the quality or speed of the research and design process; on a better match between a product and end-users' needs or preferences; and on end-users' satisfaction. As a response, user involvement is seen as a way to obtain valuable input from end-users.

4.9. Co-design

Sanders and Stappers (2008) defined co-design like the "collective creativity as it is applied across the whole span of a design process". In line with this, they focus on co-design in his narrower sense, that

is, on creative cooperation during design processes. According to these authors, co-design is basically a useful tool in services design, in which users play an important role. Therefore, users are the principal instrument in co-design, and it is necessary understand and interpret their needs. They propose the option of letting them to act as co-designers if they have the necessary level of expertise, passion and creativity. Co-design allows obtain benefits to know narrower what users want. In co-design, designers use the ideas generated by others as sources of inspiration and innovation. The authors explained co-design for product or service sectors, regardless of the goal and the industry. Liao and Lee (2010) analyse co-design in bra products design as a way for avoiding design failure and promote customer loyalty and satisfaction. The method they use to collect information is a questionnaire.

4.10. Co-production

Morelli (2009) uses the term co-production to indicate "the active participation of customers to the value production process". Lang et al. (2009, p. 33) use interchangeably the terms co-production and co-creation. In the context of cultural content, they use the terms to refer to "reuse and recombination of previously recorded content components".

4.11. Consumer innovation

Mühlabacher (2010) indicate that consumer innovation exist when the user of the product or service use their own tools to develop a new innovation concept, product or service. The author indicates that consumers who are involved in a virtual NPD task and have previously participated in NPD tasks should be able to actively experience innovative products and to express their creative ideas more easily. The article talks about the use of innovation in a virtual context and shows different hypotheses in relation to consumer innovation. To obtain the data, he uses an online survey for data collection, an online pre-test with 25 participants, and subsequent telephone interviews with those participants led to an adjusted questionnaire.

4.11. Customer participation

Chan et al. (2010) analyze the effects of customer participation (CP) on value creation and satisfaction. They establish that customer participation have to be analyze since the employees and customer's perspectives. The article use data collected from 349 pairs of customers and service employees in two national groups to examine the results that CP generate in a professional financial service. The authors want to know more about customer satisfaction, employee job satisfaction and performance, and how are related each one of the concepts. Also, they demonstrate how the effects of CP depend on cultural value orientations. Finally, to sum up authors show how the results confirm that value creation is increasing when employees and customers participate together. To maximize benefits and minimize costs of CP in a firm, managers should match customers and employees by their cultural value orientations.

4.12. Living lab

Dell'Era and Landoni (2014) define living lab as "a design research methodology aimed at co-creating innovation through the involvement of aware users in a real-life setting". Leminen (2015) says that living labs are characterized by openness and user involvement to provide an emerging approach to

user innovation. The approach assumes that firms must consider ideas stemming from external sources for the development and commercialization of innovation. Moreover, living labs are characterized by collaboration between users and other stakeholders in real-life environments. Albors (2015) explains how the Spanish retailer Mercadona selects users to participate in co-innovation labs, helping the company to decide the products that will be finally sold or giving ideas to improve the existing products.

4.13. Lead user

Kratzer et al. (2016) also show how the term of lead user is becoming an important concept. The authors present empirical studies and methods to provide robust evidence that lead users have a distinctive social network position. They define lead user in three different ways: Lead users can be identified as bridges in (online) social networks using readily applicable software tools. In more general point of view show lead users like the most effective methods to identify ideas and concepts for really new products. Authors also show that not all the users can be lead user, and it is necessary a previous knowledge about them and their aptitudes.

4. Discussion. Interrelations of the Different Terms/Meanings

Since our aim is to provide and increase understanding of participation in design, across the design community and product development, we want to clarify these concepts.

The close relationship between the words used to share information relevant to design, with the "end users" and skateholders, makes difficult to adopt/select them by the companies interested on increasing this relation. In fact, there are concepts quite similar and their ignorance can carry on mistakes and misunderstandings. This study tries to offer a perspective of the terminology used related with the topic of participation, considering that to increase knowledge about these concepts, will help us to understand the tendency of taking account the users.

At this stage we have obtained the network of co-occurrences of keywords related to user involvement. Then, we have used the tool VOSviewer to represent the network in Figure 3. Links in the figure indicate those keywords that appear in the same paper. Moreover, we can observe that the terms "user involvement", "user innovation", "co-creation" and "lead user" are the most used among all of these terms. The Figure 3 shows that there are concepts that the authors use interchangeably in their works, these are represented by the links among keywords.
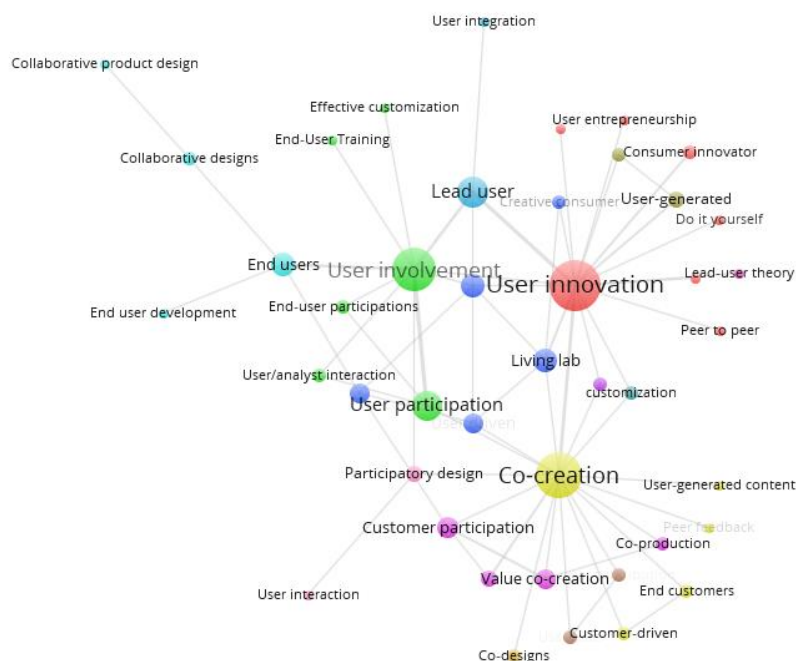
Fig. 3. Network representing co-occurrence of user's keywords. Source: own elaboration

The terminology has been evolving and different authors use terms to refer on similar concepts related with participation, in a different way. Since 2010, we can observe how there is an increase of articles and authors that deals with the concept of "participation".

However, it is important to pay attention to some holistic concepts such as *open* design (De Couvreur et al., 2010), stated as a tool to share, in an orderly and methodical way, information about design; and *empathic design* as a relatively new branch of user-centred design (Postma et al., 2012).

*Empathic design (*Leonard and Rayport, 1997) supports design teams in building creative understanding and involvement. Postma et al. (2012) explain that in *empathic design* approaches, the members of a design team (who may or may not be educated in design) adopt the role of people researchers and directly interact with users to ensure that their perspective is included in design. Some recent ideas such as "User-generated content" Plank (2016), insists on the importance of the correct interpretation of user generated content. "User generated content" occurs when user participates in platforms giving their own experiences and feedback to each other.

5. Conclusions

This study has offered a perspective of the breadth topic on getting information from users in order to take advantage at the design development stage. In this article, we argue that the user participation is being more and more important to design culture and seems to increase the user satisfaction and the product success. The revised literature shows that the relations between the user's participation and the strategy or models of business have increased during the last decade.

Other conclusions reached in this research are:

The wide selection of approaches review, demonstrate the increasingly value of the approach to the users and feeds new design thinking.

Users have been identified as developers of relevant innovations in products and processes and their role has changed on behalf the use of new technologies.

Regarding the terms and meanings, there is a variation in the use of these terms by authors: a displacement in the employment of the word consumer, to client or user.

Finally, through the article we can affirm the value of understanding the users needs. The new ways of design are changing and firms are opening some of their processes to promote this participation. The users have become a key element on the development of products and services. As a consequence, getting the user's participation is a way for the design's success. Firms should offer a new perspective to present their concepts, products and services, to engage users in their projects. The communication and digital tools are playing an important role on the evolution of participation because they provide a useful, faster and easy way to implement it. Nowadays, people have plenty of possibilities to share their preferences and they feel happy to take part in the co- creation process.

The next step in our research will explore the companies concerns on the use of Co-design in the development and improvement of new products and services in their value propositions. The goal would be to answer questions related to how firms come with participation and further, the value of the results they obtain due to participation.

References

Andreas, P. (2016). The hidden risk in user-generated content: An investigation of ski tourers' revealed risk-taking behavior on an online outdoor sports platform. Tourism management, 55, 289-296. doi: 10.1016/j.tourman.2016.02.013.

Battarbee, K. (2003, January). Defining Co-Experience. In Proceedings of the International Conference on Designing Pleasurable Products and Interfaces, 109–113. doi: 10.1145/782896.782923.

Battarbee, K. & Koskinen, I. (2008). Product Experience. Elsevier.

Prahalad, C.K & Ramaswamy, V. (2004). The Future of Competition:Co-creating unique value with customers. Harvard Business School Press; edition 1.

Christoph, B. & Frank, P. (2003). Customer as co-designers. lEE Manufacturing Engineer, 42-45. ftp://service.boulder.ibm.com/software/emea/dk/frontlines/adidas.pdf.

De Couvreur, L. & Goossens, R. (2011). Design for (every) one: Co-creation as a bridge between universal design and rehabilitation engineering. In Proceedings of the 7th International Conference on Design and Emotion. doi: 10.1080/15710882.2011.609890.

De-Miguel-Molina et al. (2015). Corporate philanthropy and community involvement. Analysing companies from France, Germany, the Netherlands and Spain. Springer science, 50(6), 2741–2766. doi:10.1007/s11135-015-0287-9.

Franke, N., Schreier, M., & Kaiser, U. (2010). The "I Designed It Myself" Effect in Mass Customization. Management Science 56(1), 125–140. doi:10.1287/mnsc.1090.1077.

Füller, J., Mühlbacher, H., Matzler, K., & Jawecki, G. (2009). Consumer Empowerment Through Internet-Based Co-creation. Journal of Management Information Systems, 26(3), 71 – 102. doi:10.2753/MIS0742-1222260303.

Hawk, S., & Aldag, R. (1990). Measurement biases in user involvement research. Omega, 18(6), 605-613. doi:10.1016/0305-0483(90)90052-B.

Harhoff, D., Henkel, J., & von Hippel, E. (2003). Profiting from voluntary information spillovers: how users benefit by freely revealing their innovations. Research Policy, 32(10), 1753-1769. doi:10.1016/S0048-7333(03)00061-1.

Grönroos, C., & Gummerus, J. (2014).The service revolution and its marketing implications: service logic vs service-dominant logic. Managing Service Quality, 24(3), 206 – 229. doi:10.1108/MSQ-03-2014-0042.

Kratzer, J., Lettl, C., Franke, N., & Gloor, P. (2015). The Social Network Position of Lead Users. Journal of Product Innovation Management published by Wiley Periodicals, Inc. on behalf of Product Development and Management Association. 33(2), 201 – 216. doi: 10.1111/jpim.12291.

Wa Chan, K., Yim, B., & Lam, S. (2010). Is Customer Participation in Value Creation a Double-Edged Sword? Evidence from Professional Financial Services Across Cultures. Article in Journal of Marketing. 74(3), 48-64. doi: 10.1509/jmkg.74.3.48.

Leonard, D., & Rayport, JF. (1997). Spark innovation through empathic design. Harvard business review. 75(6), 102 -113. doi: 10.1142/9789814295505_0016.

Zhao, M., & Ruby Roy Dholakia, R.R. (2009). A multi-attribute model of web site interactivity and customer satisfaction: An application of the Kano model. Managing Service Quality: An International Journal, 19(3), 286 – 307. doi:10.1108/09604520910955311.

Palvia, P., & Palvia, S. (1988). The feasibility study in information systems: an analysis of criteria and contents. Information and Management, 14(5), 211-224. doi:10.1016/0378-7206(88)90009-2.

Prahalad, C.K. & Ramaswamy, V. (2004). Co-creation Experiences: The Next Practice in Value Creation. Journal of Interactive Marketing, 18 (3), 5–14. doi:10.1002/dir.20015.

Sanders, E. B. N. & Stappers, P. J. (2008). Co-creation and the new landscapes of design. CoDesign, 4(1), 5–18. doi:10.1080/15710880701875068.

Sanders, L. & Stappers, P. J. (2014). From designing to co-designing to collective dreaming : Three Slices in Time. Interactions, 21(6), 24–33. doi: 10.1145/2670616.

Schonberger, R. J. (1980). Mis design: A contingency approach. MIS Quarterly: Management Information Systems, 4(1), 13–20. doi: 10.2307/248864.

Von Hippel, E. (1986). Lead users: a source of novel product concepts. Management Science, 32 (7), 791–805. doi: 10.1287/mnsc.32.7.791.

About the Authors:

Lucía Sánchez de la Guía is a PhD student in Product Design Engineering and Management of Industrial Projects at Universidad Politécnica de Valencia and Designer at Raloe Mediterraneo S.L. Bachelor degree in Engineer Industrial Design and Product Development (UPV, 2014), Master of Management of Business, Products and Services (UPV, 2016).

Marina Puyuelo Cazorla Professor at the SCHOOL OF DESIGN ENGINEERING, since 2010 head the Degree of Engineering in Industrial Design and Product Development at the Universitat Politècnica de València. Working on design from 1986, she has developed research projects, publications and other activities related to product and inclusive design, accessibility and social innovation.

Blanca de-Miguel-Molina is an associate professor at the Universitat Politècnica de València, Department of Management and Faculty of Business Administration and Management. Her core lectures involve Business Models, New Trends in Service Strategies, and Services Design. Supervisor of different Doctoral and Master Dissertations.