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WELL-BEING, HAPPINESS AND ICT: PRODUCTIVE ALLIANCE FOR HUMAN DEVELOPMENT?

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Abstract

Information and communication technologies (ICT) in the 21st century have taken root as an essential part of human life and it is necessary to review the productive alliance that can occur with welfare, happiness and human development. The main objective of this article is to analyze the contributions, challenges, challenges and risks that may exist when linking studies and interventions in the field of well-being and happiness with technological tools and platforms that can impact human development. The work derives from research actions carried out by the authors associating these two lines of work: happiness and well-being and technological applications. The presentation shows a critical analysis of the relationship between Information and Communication Technologies (ICT) and human Happiness and Well-being, from a viewpoint of the key aspects that promote the understanding of the conceptions of Happiness and Well-being from different perspectives, such as the views of health organizations, research perspectives of psychology, sociology and economics and that are connected with the technological aspects of the current historical moment. From this conceptual analysis, the panorama and trajectory of wellbeing research from the productivity achieved with the use and implementation of technological tools is presented. It ends with a real case of application of technologies in a process of research and intervention in the science of well-being.

Key words: Well-being, Happiness, technology, ICT, technological applications.

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Introduction

Happiness, well-being and technological development: spinning in context

The impact of technology on states of happiness and well-being in humans is multifaceted and evolving at breakneck speeds, presenting opportunities, challenges and risks to mental health and overall life satisfaction. Taking into account that Information and Communication Technologies (ICT), "are the set of resources, tools, equipment, software, applications, networks and media; that allow the compilation, processing, storage, transmission of information such as: voice, data, text, video and images" (Art. 6 Law 1341 of 2009, Colombia), it has been observed that the rise of social networks and remote relationship modes have generated changes in interpersonal interactions and in social valuations regarding what is considered as approved and not approved in different contexts, needs and practices, marking routes and human positions that were unimaginable in other times.

At present, there are valuable research advances that have contributed to the understanding of well-being from the individual to the collective level, which has been influenced by technology, reducing barriers and distances, making it possible to perform tasks in everyday contexts. Technological development has been an *engine of transformation* in societies that impacts the economy and productivity. For this reason, it is essential to understand how emerging technologies such as artificial intelligence, biotechnology and automation (technological applications in the form of tools, programs and projects) will shape people's lives, while increasing efficiency and improving the quality of life, reducing diseases, prolonging life expectancy and strengthening well-being and happiness (Liao, 2023).

While technology has the potential to improve quality of life, the rapid pace of change in this field can also lead to stress and anxiety, because many people find it difficult to adapt to innovations, which can negatively affect their mental health (López-Concepción, Gil-Lacruz, Saz-Gil & Bazán-Monasterio, 2022). On the other hand, the need to make digital habits conscious is considered, due to the excessive use of social networks and the risk of addiction and social isolation generating mental health conditions. Accordingly, Bora & Neelakandan (2023), propose a *digital detoxification* in which adolescents would be the most benefited, and therefore education and psychology have a fundamental role in this purpose.

The risks outlined require careful management and design to ensure that it serves to enhance rather than detract from mental health. For the future it would be expected that all digital experiences are designed to support flourishing, so technology must be functional and contribute positively to the mental health and emotional well-being of users, so the goal is to create a scenario in which human lives are enhanced rather than detracted from (Calvo & Peters, 2017).

Under this look this article is developed, showing the productive alliance between Happiness, Wellbeing and technologies, focused on *three key points*: theoretical analysis on Wellbeing and technologies, contributions of Technology to Wellbeing through concrete studies and the presentation of a research exercise that evidences the mentioned alliance.

Objective

The main objective of this paper is to analyze the alliance between happiness, well-being and information and communication technologies, with concrete examples of studies and interventions based on the use of technological tools and platforms, which can contribute to human development, in order to propose horizons in studies in the field of human well-being.

Development

Conceptualization and Theoretical Analysis on Well-being, Happiness and Technologies

Happiness and well-being are complex concepts that have been studied by various disciplines, including psychology, sociology and economics. Research on Well-being has developed several conceptual and theoretical approaches and has been grouped as models of Well-being for its comprehensions, appearing models such as Subjective, Psychological and Social Well-being, as explanatory elements of a complete model of Well-being (Blanco and Rodriguez, 2007).

On Subjective Well-being, the main author Diener et al. (2009) defines it as:

> ...cognitive and affective evaluations that a person makes about his or her life, including emotional reactions to events, as well as judgments about satisfaction and achievement, from the dimensions pleasant emotions, negative emotions, and high level of life satisfaction (p. 63).

On the other hand, Psychological Well-being is shown from the well-known multidimensional model proposed by Ryff and Keyes (1995) and which is related to the eudaimonic approach proposed by Aristotle, as an indicator of well-being and is proposed as a generator of subjective

well-being (Suárez-Barros et al., 2022; p. 143). Finally, the proposal of social well-being is related to the valuation that people make of their circumstances and their functioning within society, located in an environment of which others are part individually and as a group (Ryff & Keyes, 1995, p. 122).

From psychology, one of the first authors who studied the subject is Michael Argyle and expressed: "Happiness can be understood as a reflection on satisfaction with life or as frequency and intensity of positive emotions" (Argyle, 1992, p.25). This author shows how there are two aspects of the concept of happiness, one related to a factor of global satisfaction, while the other focuses on experiences related to specific emotional responses such as joy, pleasure, ecstasy and others. From a view of the psychology of motivation and emotion, concepts have been put forward that define it as an emotion, and considers that happiness is one of four emotions that "reflect reactions to the essential quests of life: attainment (happiness), loss (sadness), obstruction (anger) and uncertainty (fear)" (Stein and Trabasso, 1992, cited by Reeve, 2010; p. 230).

These aspects are related to the concept of hedonic happiness posed by the classical Greeks, linked to the pleasant life and short-term enjoyment factors; while the eudaimonic happiness posed by Aristotle (Pigliucci, 2018), is related to the factors in which people feel greater happiness in the long term and permanently in their lives.

Additionally, these two tendencies or aspects of happiness are associated with different brain systems that affect the psyche and are related to different responses, being the emotional and focused on short-term pleasures and hedonic happiness sensations what is related to the limbic system and the amygdala. On the other hand the tendencies to a eudaimonic or global satisfaction look, imply that these are factors associated with personality styles which in turn are associated with heredity, but are also modifiable by the context and developmental histories of the individual (Damasio, 2013; Reeve, 2010).

In the 21st century, other organizations also define well-being. World Health Organization (2014), for example, recognizes well-being as a general state of physical, mental, and social health. The American Psychological Association, (APA), assumes well-being as the "state of happiness, contentment, low levels of distress, general good mental and physical health, and good appearance or good quality of life" (2010, p. 58).

The above leads to think that the conceptualizations on the field of study of Well-being and Happiness have been present in every historical moment of society for being elements of great importance for man who is always in search of his sense of life, his freedom and his quality of life. It is inferred, then, that the elements that characterize each period of society through time, permeate people in their experiences and experiences and are reflected in their psyche, in their cognitive functions, emotional states, interpersonal relationships, their attitudes, aptitudes, motivations and behaviors.

Under this conceptual analysis of well-being studies and within the framework of the digital era, in the 21st century, it is found that ICTs have become an integral part of daily life, influencing forms of communication, work and leisure enjoyment. Information and Communication Technologies (ICTs) have drastically transformed the way we interact with the world and with each other. It is therefore necessary to review research and interventions on the subject, as some suggest that the use of ICTs can have negative effects on people's well-being and happiness, while others highlight their potential benefits.

ICTs and Well-being and Happiness

Adverse aspects. Excessive use of social networks and other digital platforms can lead to information overload, resulting in stress and anxiety. Twenge et al. (2018) demonstrated that increased use of *smartphones* and social networks is correlated with an increase in depressive symptoms among adolescents, suggesting that constant exposure to these platforms may contribute to a decrease in emotional well-being.

The fact that social networks have grown exponentially in recent times is due in part, to the fact that they allow for the expansion of connections that are social, but not face-to-face, which facilitates many more interactions than in live or live forms of interaction, implying possibilities for relationships with fake profiles or with disguised or much more modified interests than those in the face-to-face form. However, social networks and related factors involve information overload, constantly increasing (Zohuri & McDaniel, 2022). On the other hand, there is a tendency to generate content, since every day it is easier to create them due to the large number of applications that facilitate it and the motivation of *influencers* (influencers) that generate interest in the public to emulate these actions and characters.

These facts have been identified as key factors that negatively affect mental health. Constant exposure to digital stimuli can generate a feeling of fatigue and cognitive stress, reducing the ability to concentrate and affecting productivity and satisfaction with life (Kuss & Griffiths, 2011, 2017). In this context, passive use of social networks (where users simply consume content without interacting in a meaningful way, has been associated with low levels of subjective well-being (Kuss & Griffiths, 2017).

Daniel Kanheman, Psychologist and Nobel Laureate in Economics, developed a concept on motivation and proposed the Hedonistic Psychology approach, which posited that the individual was oriented in the pursuit of pleasure as the focus of Happiness, and this he structured into what he defined as "affective forecasting" which involved a tendency to project happiness based on the exaggeration of one factor of the many that come into play in the generation of well-being and he called this the "Focus Illusion" (Sahkade & Kanheman, 1998). These factors may be associated with the adverse circumstances detected by the management of virtual environments and the affectations to mental health, especially in children and adolescents.

The FoMO phenomenon

An important aspect related to the effects on people's well-being, especially in children and young people, is the phenomenon known as FoMO (Fear of Missing Out), which can be translated into English as *Fear of Missing Something*. It was introduced in 2004 by Gupta and Sharma and some experts consider it a syndrome, disorder or phenomenon that may be at the basis of addiction to virtual environments, especially social networks. This phenomenon is characterized by the fact that the person feels very lonely and has difficulties to relate and coexist because he/she feels unpopular and has difficulties to integrate from generating ideals and models that he/she is unable to achieve. It is accompanied by symptoms such as insomnia, high anxiety, low self-esteem and depression that alter mental health. FoMO includes two processes: firstly, the perception of missing out on something and, secondly, compulsive behavior to maintain these social connections.

This is a complex construct that is linked to needs to "belong and form stable interpersonal relationships" (2021, p. 1) and to *receive pleasant responses* from networks in search of satisfaction, which is related to the hedonistic model of well-being. Additionally, an increase in self-injurious behaviors has been found in adolescents, especially in females, and this has been related to the ideals proposed by these media (Nesi et. al., 2021).

Contributions of Technology to the Development of Human Wellbeing

ICT can provide access to varied and relevant information, facilitates the establishment of social connections and expands learning opportunities, which can contribute to greater happiness and well-being from the needs of users (Best et al., 2014).

Another important aspect is the option of digital *literacy* in promoting happiness and well-being in the digital age. This idea refers to the ability to use ICTs effectively and responsibly to promote information, techniques and knowledge about people's well-being and happiness (Livingstone et al., 2014). Equally interesting and powerful is the idea of designing technologies that generate connections between people focused on experiencing social *presence* and *connection*, to overcome feelings of isolation, absence and little contact (Turkle, 2015).

In relation to the above, the proposals in the health framework, are oriented to grow telehealth and online mental health services, to reduce the gaps of social and geographical inequity and thereby also improve the quality of life and reduce untreated mental problems. The potential to develop algorithms in the service of health, will serve for care and psychological assessments at the individual and community level and argue decisions in the construction of evidence-based policies (Bartram, et al., 2018), favoring more likely to perceive technological advances as beneficial for greater satisfaction with life (López-Concepción et al*.,* 2022).

From this position of productive alliance between well-being, happiness and ICT, the following table presents examples of technological applications created to contribute to the human development of the subject in various areas and dimensions.

Table 1
List of technological applications that contribute to human development

Application	Objective	Strengths	Weaknesses	English
Headspace	Offers guided meditations to reduce stress	Accessible and easy to use; variety of topics.	May require subscription for full content	SI
Calm	Promotes meditation and healthy sleep	Includes soothing music and sleep stories	Interface can be overwhelming for some users	SI
Happify	Promotes happiness through interactive activities	Based on positive science; effective gamification	Some activities may seem superficial	YES
Moodfit	Comprehensive tool for tracking emotional state	Customizable; includes self-help exercises	Requires regular use time to be effective. I	NO
MyFitnessPal	Helps manage physical and emotional health through nutritional and exercise tracking	Promotes healthy habits; features active community	Can cause anxiety if you become obsessive about numbers	NO
Youper	Uses chatbots to help manage anxiety and depression	Constant interaction; daily emotional analysis	May not warn of need for professional therapy in severe cases	NO
Insight Timer	Offers thousands of free meditations and resources on mindfulness	Wide variety; active global community	Quality may vary between different guides/meditators. I	NO
Simple Habit	Designed for meditating at short times during the day	Efficient for people with limited time; easy access.	Limited in free content; some users may need more depth.	YES

Application	Objective	Strengths	Weaknesses	English
7Cups	Provides emotional support through chat with trained listeners	Access to immediate support; supportive community	Not a substitute for professional therapy; variable quality among listeners.	SI
Smiling Mind	Structured program based on mindfulness aimed at different age groups.	Educational approach; designed by psychologists	May not be sufficient for more serious problems.	NO

Note: The table shows 10 technological applications designed by different programmers to support personal and human development and growth processes.
Source: Own elaboration based on Anderson & Rainie (2018); Flett & Heisel (2019); Keng, Smoski & Robins (2011) and Riva (2022).

Investigative exercise: an alliance between technology and well-being.

This section presents a concrete example of a research that was conceived as an applied project with an external partner between two public entities in Colombia: the National, Open and Distance University (UNAD) and the National Learning Service (SENA). The objective of the process was to develop a platform with web technology to support the structuring of the Life Project in young students, for educational contexts and is the result of a systematic research process and over time, from a chain of research associated with happiness, well-being, and the life project.

The final result achieved is an application developed on a web technology platform that facilitates the support to the structuring of the Life Project in young people, through the design of three disciplinary modules articulated among them, in which self-evaluation, self-reflection and proposals of perspectives for the improvement of their own life, with self-analysis and self-reports predominate. The application offers an intuitive interface, interactive tools and a robust *backend* to facilitate the structuring and monitoring of the young students' life project (in web development, backend is the part that works "behind the scenes"). Documented evidence supports the development process and guarantees the quality and effectiveness of the final product.

The research proposal was developed under a quantitative, quasi-experimental approach, through which the design, structure and application of a Psychosocial Intervention Program for adolescents and young adults was proposed, from a psychoemotional model based on the design and development of Life Projects and five categories with their respective subcategories:

1. Life Goals and Achievements (Subcategories: Self-support, Well-being, Economic Stability); *2. Meta-cognitive and Executive Functions* (Subcategories: Self-care, Self-knowledge, Self-determination, Self-realization, Need for recognition, Planning, Decision-making, Time management, Affective and financial balance); *3. Resources and Coping Mechanisms* (Subcategories: Growth and Improvement Strategies, Education, Sense and Meanings); *5. Identity and Social Environment and Contexts* (Subcategories: Contribution to Community, Contribution to Family/Interaction, Culture, Work, Personal Success, Family Support, Budget Organization, Cultural Transmission, Religion/Spirituality).

The participant population was adolescents and young adults from an educational institution, between 14 and 25 years of age, who develop learning processes in different levels of training for work (technical, technologist and professional), who meet the criteria of age and intention to participate.

The development of the research starts with a phase of Conceptualization, on Life Project, Psychosocial Intervention Programs, following with the phase of Structuring the intervention program, which includes the methodological design, development and adaptation of collection instruments and evaluation of the proposal, which allowed entering the phase of Implementation and Evaluation, which will review the rationale of the program with the application of the same to a sample of adolescents and young adults, with the use of the instruments and the web application of life project. In the final phase, of Projection and socialization of the Research, the results were analyzed to prepare the research report for the participating entities, and its corresponding dissemination and publication. The techniques and instruments used will combine quantitative (questionnaires, tests) and qualitative (focus group and in-depth interviews).

The traceability of the process allowed the generation of knowledge and needs that led to an autonomous and self-directed intervention proposal through the design of a web application. The following figure shows the timeline of the research that supported the applied project that was carried out.

Figure 1. Research Traceability

Note: Supporting projects for the technological application development project.
Source: Authors (2024)

The methodology was developed from two lines: *a first technological line* that is defined from the parameters of systems engineering from the development of modules on a web platform in PHP programming language and Mysql database, to the validation by algorithm execution tests. The platform, from the organization of the disciplinary material and the technical sequence of psychosocial intervention is supported by playful interactive tools and psychoeducation, such as word searches, audios (podcast), interactive videos, evaluations and PDFs to facilitate information, training, evaluation and qualification of variables and key factors in the configuration of the life project. A *second methodological conceptual line* with the structuring of the disciplinary base material, from previous research (Rojas-Otálora and Suárez-Barros, 2015; 2016, 2019) organizing the coherence, consistency and friendliness of the material presented for the agile use and management for the users of the application.

Analysis and Explanation

Happiness and human well-being have been studied through the ages and are mentioned interchangeably (Lyubomirsky & Lepper, 1999; Riff & Singer, 2007) and have been varying and becoming more dynamic according to the socioeconomic, political and cultural conditions in accordance with the characteristics and needs of the historical environment of the evolution of civilization (Suárez-Barros, 2024). In the 21st century, social conditions have intensified socioeconomic and technological components and the freedom of the individual, as sociological theories affirm, is permeated by rules of the structure of social life (Giddens, cited by Martel and Marroquín, 2001), migrating towards more subtle and complex forms of modernity, in terms of liquid modernity (Bauman, 2003) or Network societies (Castells, 1998).

According to authors such as Harari (2018) and Mercado-Maldonado (2011), this historical period is one of radical transformations, contemporary world issues and processes of change and immense challenges. This is reflected in issues related to dataism and "Turbulence, chaos and disorder are the characteristic signs that convulse our societies in this historical moment" (Mercado-Maldonado, 2011, p.5), which affects human well-being and happiness.

The above invites the analysis of new technologies such as artificial intelligence, genetic engineering (Harari, 2018, p.2012) and to review how the existence of ICT and electronic communications "alter the very texture of our lives, whether we are rich or poor" (Harari, 2016, p. 3) and how the social sciences, psychology and the science of well-being, have challenges and challenges in the face of the adverse effects and contributions that technologies can make to generate productive partnerships for human development.

Although technology has great potential to improve well-being, it also poses risks that require careful management and design to ensure that it serves to enhance rather than detract from mental health, for the future it would be expected that all digital experiences are designed to support flourishing, so technology must be functional and contribute positively to the mental health and emotional well-being of users, so the goal is to create a scenario in which it enhances our lives rather than detract from them (Calvo & Peters, 2017).

From this panorama, it can be inferred that the trend that exists in this century is the permanent use of technologies in all dimensions of human life and that they should be taken into account as contributing elements to the field of study of well-being and happiness, as long as there are ethical elements in their use, derived from systematic and rigorous research, with differential and interdisciplinary approaches that include the ethnic variety, that understand the implications in public policies and that are the product of exercises that contribute to well-being in context, from territorial perspectives and seeking to move from studies of well-being from the individual to the community.

Conclusions

Digitalization and artificial intelligence can help to make public policies better and more personal, to improve society and reduce inequalities and although there is a significant concern about labor displacement due to artificial intelligences that contrasts with the need for adaptation and that will have to be managed from financial preparation and maintenance of an open mind to navigate the future labor market (Wang, 2022).

In the context of technology development, mobile applications and other data science-based digital technologies have revolutionized the way in which mental health services are delivered. These tools allow people to access human wellness interventions and resources from anywhere, which is useful in rural areas or for people with limited mobility. This also

facilitates continuous monitoring and real-time feedback, which is essential for the effectiveness of psychological interventions.

The advantages that ICTs offer to close social and geographic gaps, reduce time and reach more people, can be of great value for the design of research, interventions and accompaniment in the field of well-being and happiness. They constitute tools that help to meet the challenges and challenges that arise in the prospective of wellbeing studies in this century.

ICT can contribute to achieve predictive and inferential measurements in different contexts of action, ensuring a greater number of participants and promoting comparative studies in different regions, states, countries and even continents. The horizons in well-being studies invite the closing of conceptual gaps on well-being, which requires that the methodological designs and instruments used overcome simplistic and shallow positions that minimize the multidimensionality of the concept, and for this exercise, the use of information and communication technologies can make a great contribution. In addition, they can contribute to studies of well-being in context, from territorial dimensions, reducing costs and time and ensuring the participation of professionals from other disciplines with transnational teams. In other words, from many perspectives and controlling adverse effects, a productive alliance between ICTs and well-being and happiness can be achieved.

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