Review article

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Autor para correspondencia: francisco.arias@unev.edu.hn

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Jorge Campos [1]
Universidad FUNDEPOS
https://orcid.org/0000-0003-0467-6190
jcampos@fundepos.ac.cr
Costa Rica

Sergio Navas [2]
Universidad FUNDEPOS
https://orcid.org/0009-0002-6377-4575
snavas@fundepos.ac.cr
Costa Rica

Francisco Arias [3]
Instituto Universitario de Educación Virtual (UNEV)
https://orcid.org/0000-0002-4483-1741
francisco.arias@unev.edu.hn
Honduras

Acquiring crucial competencies for sustainability: preparing for the green transition

Adquiriendo competencias cruciales para la sostenibilidad: preparándose para la transición verde

Adquirindo competências cruciais para a sustentabilidade: preparandose para a transição verde

Abstract

Introduction: life skills are fundamental for the success of any individual, whether in the workplace or social sphere. **Objective:** to analyze what these skills are, based on the most recognized definition, which emphasizes the need for emerging skills such as digital and soft skills, as well as their relevance for personal competitiveness, especially in the context of the digitized society in which we live. **Methodology:** this work was carried out by analyzing various sources of information on the Internet about the topic of vital skills, focusing on the new skills necessary for competitiveness within the green economy revolution towards which the planet is heading. **Results:** the low acquisition of these skills by graduates is also highlighted. **Conclusion:** this preliminary analysis leads to the exploration of other skills, some less known or mentioned, that could help us adapt to the growing environmental pressure we face, caused by the rampant pollution of land, seas, and air generated by our consumption and production practices. In our opinion, these will be the truly crucial skills for life in the coming decades.

Keywords: skills, digitalization, adaptation, sustainability

Resumen

Introducción: las competencias para la vida son fundamentales para el éxito de cualquier individuo, ya sea en el ámbito laboral o social. **Objetivo:** analizar cuáles son esas competencias, basándose en la definición más reconocida, que subraya la necesidad de competencias emergentes como las digitales o las blandas, así como en su relevancia para la competitividad personal, especialmente en el contexto de la sociedad digitalizada en la que vivimos. **Metodología:** este trabajo se realizó analizando diversas fuentes de información en Internet sobre el tema de las competencias vitales, centrándose en las nuevas competencias necesarias para la competitividad dentro de la revolución de la economía verde hacia la que se orienta el planeta.

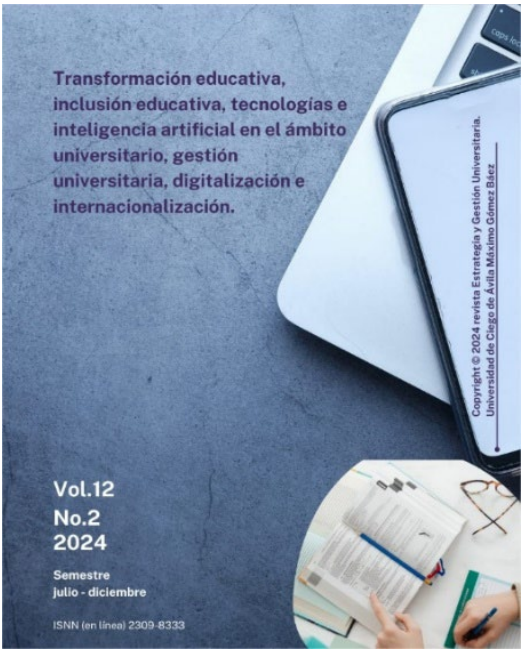
Resultados: también se destaca la escasa adquisición de estas competencias por parte de los graduados. **Conclusión:** este análisis preliminar conduce a la exploración de otras competencias, algunas menos conocidas o menos mencionadas, que podrían ayudarnos a adaptarnos a la creciente presión ambiental que enfrentamos, causada por la desenfrenada contaminación de tierras, mares y aire generada por nuestras prácticas de consumo y producción. A nuestro parecer, estas serán las competencias verdaderamente cruciales para la vida en las décadas venideras.

Palabras clave: competencias, digitalización, adaptación, sostenibilidad

Resumo

Introdução: as competências para a vida são fundamentais para o sucesso de qualquer indivíduo, seja no âmbito laboral ou social. **Objetivo:** analisar quais são essas competências, baseando-se na definição mais reconhecida, que destaca a necessidade de competências emergentes como as digitais ou as interpessoais, bem como sua relevância para a competitividade pessoal, especialmente no contexto da sociedade digitalizada em que vivemos. **Metodologia:** este trabalho foi realizado analisando diversas fontes de informação na Internet sobre o tema das competências vitais, concentrando-se nas novas competências necessárias para a competitividade dentro da revolução da economia verde para a qual o planeta está se orientando. **Resultados:** também se destaca a baixa aquisição dessas competências por parte dos graduados. **Conclusão:** esta análise preliminar leva à exploração de outras competências, algumas menos conhecidas ou mencionadas, que poderiam nos ajudar a nos adaptar à crescente pressão ambiental que enfrentamos, causada pela desenfreada poluição de terras, mares e ar gerada por nossas práticas de consumo e produção. A nosso ver, essas serão as competências verdadeiramente cruciais para a vida nas próximas décadas.

Palavras-chave: competências, digitalização, adaptação, sustentabilidade



Introduction

Competencies are essential for a person to be successful in managing their life in general, including family, friendships, work, or business. They involve our understanding of the environment and how we respond to the stimuli we receive. Evidently, they are based on our preparation and experience. The use of these competencies, or rather which ones prove to be more important than others (Magano et al., 2020; García-Pérez et al., 2021; Presti et al., 2022; Chavarría, 2023), will depend on that multidimensional environment that we need to read correctly to respond appropriately, adapt, and be resilient.

An Eskimo will require specific competencies in various areas that allow them to survive in their environment (e.g., identifying types of ice, traveling by sled, seal hunting, building igloos), which are not the same as those required by a member of an Amazonian tribe. However, there are many commonalities regarding environmental awareness, such as identifying problems, assessing risks, seeking solutions, finding opportunities, making decisions, collaborating, and adapting (Sagone et al., 2020; Singla et al., 2020).

Today, there is a strong emphasis on soft skills as a success factor for both individuals and companies. Alvarez-Meaza et al., (2020) It describes it as follows, these personal and social competencies facilitate human relationships and enable success in any area of life, including the workplace. These skills are related to emotional intelligence, critical thinking, leadership, resilience, or change management, being fundamental for professional development and business growth.

The same Iberdrola article highlights a very relevant point based on a 2021 IBM study involving 5,800 executives from 50 countries. Josh Bersin points out the difficulty of finding people with soft skills, as more than 45% of human resources directors claim that university graduates possess the necessary digital skills but lack those focused on problemsolving, teamwork, or leadership.

This is important to bear in mind, as we will mention it later in the context of this analysis, which aims to demonstrate that we are not correctly interpreting our environment when defining new competencies for life.

1.1 Current Definition of Life Competencies

We will use some examples of how these competencies are defined (and interpreted), which are universally presented—and this is always emphasized—as indispensable for success and competitiveness (personal or business).

The Ministry of Education of Costa Rica (2023) states that competencies are: "The knowledge, skills, and attitudes necessary to successfully face the challenges posed by daily life, inviting us to reformulate life projects."

It also indicates that competencies will be integrated into teacher planning because:

> "…competencies promote the understanding, expression, and interpretation of concepts, thoughts, feelings, facts, and opinions, allowing students to interact beneficially in all possible contexts throughout life, through selfknowledge, taking action, making

> decisions, and the active and proactive construction of citizenship. Additionally, values are reinforced, and intellectual curiosity, inquiry, rigorous reasoning, scientific culture in students, and the educational use of digital technologies are stimulated" (p.2).

This is outlined in the "Competency Guide" of the Ministry of Education for 2023, which teachers will use to foster the development of these competencies and enrich pedagogical mediation, according to the document. In a later section, the document refers to sustainable development and mentions elements of environmental management.

The global development and education organization IREX (2023), present in more than 100 countries, considers that essential skills contribute to business and workforce success, civic participation, resilience, and youth leadership. It mentions the following: higherorder thinking, collaboration, positive selfconcept, adaptability, interdisciplinarity, resilience, entrepreneurial thinking, communication, empathy, inclusion, and learning to learn (Lambert, 2023).

Chavarría (2023), in an article on "Life Skills," mentions that "each person will potentially have a different list of skills they consider essential in life and those they consider unnecessary." It references a 1999 publication where the World Health Organization identified six key areas of life skills: communication and interpersonal skills; decisionmaking and problemsolving; creative thinking and critical thinking; selfawareness and empathy; assertiveness and equanimity, or selfcontrol; resilience and the ability to cope with problems.

There are many more definitions of competencies or life skills provided by various companies offering training in their development, blogs, international organizations, and state entities, all revolving around the same concepts (González-Salamanca et al., 2020; Pierce et al., 2017). For instance, the OECD emphasizes that people with high levels of competency have better jobs and salaries. It also stresses that "competencies are also fundamental to people's ability to participate fully in society and its cohesion" (Škrinjarić, 2022).

The competencies established by the organization Indeed (2023) are particularly noteworthy, as they align more closely with the theme explored in this article (Schiuma et al., 2022). They consider survival skills important, as they can help ensure personal safety, recommending learning to: prepare for a major crisis, including necessary supplies; create and store an emergency water supply; use a defibrillator and perform CPR, first aid, and the Heimlich maneuver on adults, children, and infants; start a fire with and without matches; and use a portable generator (Umamah et al., 2020).

Nutritional skills are also mentioned, such as learning ways to ensure adequate hydration, understanding basic nutritional information, recognizing and debunking nutritional myths, and knowing which ingredients to eliminate from your diet (Almeida et al., 2021).

There is no doubt that the more diverse a person's skillset, the greater their

capacity for adaptation and resilience in the face of changing environmental factors. However, these competencies must adapt to new realities, meaning the list of essential skills will likely evolve, and new competencies may become necessary (Ellis et al., 2022).

Sánchez (2023) mentions six factors that will transform the future labor market: 1 Extreme longevity, 2 the emergence of intelligent systems and machines, 3 a digital future, 4 new media, 5 the creation of superstructure organizations, and 6 an interconnected and hyperconnected world. He also refers to 10 competencies that will transform the labor market:

Adaptability: Facing changes. Companies increasingly value the flexibility of their employees in dealing with changes or unforeseen events and providing solutions quickly and effectively.

- Learning: The willingness for continuous learning is a highly valued competency and is closely linked to competitiveness.
- Collaboration: Creating team spirit, sharing, collaborating, and helping others in a coordinated manner to achieve common goals.
- Communication: Building effective and honest relationships; conveying information smoothly, clearly, and truthfully, while also actively and empathetically listening.
- Creativity: The ability to generate different ideas, perspectives, and solutions to create new products or services, improve existing areas, and develop new methodologies or business models.
- Information Management: The ability to collect, filter, and classify information to discern what is relevant from what is not; organizing data.
- Emotional Intelligence: The ability to connect with others, express and manage emotions, and understand those of others; collaborating and building positive relationships.
- Loyalty: Commitment and loyalty to the culture and objectives of the organization, seeking the common good above personal interests. This depends on the moral quality and values of the employees, but also on how the company treats them as individuals.
- Motivation: Maintaining a positive attitude at work. Feeling stimulated by an activity both to start it and to see it through to completion.
- Responsibility: The ability to take control of activities and oversee a project from start to finish, managing each part of the process. It also involves being able to respond to outcomes, whether positive or negative, and to admit possible mistakes.
- While we consider these six factors as drivers for developing or acquiring new competencies, a seventh factor that already represents a global transformative force and will be even more

impactful in the coming decades needs to be added: the global environmental situation.

The environmental conditions we have experienced in recent decades which led to defining the Millennium Development Goals in 2000, the Paris Agreement adopted at COP21 in 2015, the approval of the 2030 Agenda for Sustainable Development by 193 UN member states in 2015, as well as various other COPs (25, 26, 27, 28) continue to change and deteriorate (Shulla et al., 2020). This reality compels the public and private sectors worldwide to accelerate the technological transition towards innovative actions that can halt and reverse accumulated impacts and identify adaptation strategies (Anderson et al., 2022).

This technological transition must go hand in hand with the ecological transition, as pointed out by the European Union through the European Green Deal: "These may seem like two different issues, but they are actually twin challenges, neither of which can succeed without the other, and both are equally important for Europe's future" (Eckert & Kovalevska, 2021).

It concludesthis section by referring to what Skillsyouneed (ibid.) states: "…perhaps the most important life skill is the ability and willingness to learn," since we consider this to be the essence of developing future skills, especially those that allow us to adapt to a rapidly changing climate, widespread environmental degradation, and unsustainable production and consumption habits in a finite world, with farreaching implications for growth, poverty, inequality, and fiscal stability (Cavallo et al., 2023).

Methodology

This work was conducted by analyzing various webbased sources of information on the topic of life competencias (Grazziotin et al., 2022), focusing on the new competencies necessary for competitiveness within the green economy revolution towards which the planet is oriented (Aldieri & Vinci, 2018). This shift aims to compensate for and reduce the rapid environmental deterioration we have reached. The process of information gathering, analysis, trend identification, integration, results, and conclusions began in November 2023 and extended until May 2024.

Given that the work aims to identify what we term new competencies in response to current and future environmental conditions (Brundiers et al., 2021), many of the search criteria centered on keywords such as: life competencies, new life competencies, global environmental situation, green revolution, climate change, global warming, future job competitiveness, and future employability trends, among others.

An intensive review of documents, reports, or publications from journals, organizations such as the ILO, National Geographic, IBERDROLA, the European Commission, and peerreviewed journals was conducted. In some cases, information published in opinion articles or by companies offering consultancy on competencies, which we deemed relevant, was incorporated into the analysis following discussions

among the authors, filtering content and relevance based on our experience.

This is a qualitative, interdisciplinary, and interuniversity research project, incorporating elements from various disciplines such as business administration and human talent management, focusing on competencies, as well as natural sciences, in aspects related to environmental conditions. It emphasizes global issues like atmospheric pollution and climate change, from the perspective of the expected negative impacts on human activities. This qualitative approach allows for an indepth exploration of the necessary competencies in the face of environmental challenges. It also incorporates concepts of sustainability and alternative economic development such as the green economy and the opportunities it will offer through new jobs and the new competencies needed to secure them.

A qualitative approach was utilized because, in the authors' opinion, there is sufficient documentary material from reliable sources (e.g., UN, IPCC, OECD) to understand the global environmental situation, especially the historical context. Evidently, conducting empirical research was beyond our academic, economic, and time resources. The welldocumented qualitative approach we undertook is robust enough to present the nature of the problem we identified (White & Cooper, 2022), as well as to provide a sufficiently detailed and referenced analysis, representing a new and valuable contribution to the areas of knowledge we explored.

This research is based on documentary information sourced from the internet and filtered according to the combined experience of the authors in business and natural sciences, ensuring the use of reliable information to develop the central argument (Tight, 2019). The competencies for life deemed indispensable today, related to soft or digital skills, are insufficient to prepare future professionals who will operate in a world with demands beyond these skills. Copyright and academic integrity have been respected by properly citing all sources.

With a substantial body of evidence regarding the current and future environmental situation, welldocumented by international organizations and the scientific community, the foundation of the argument is established. It posits that these environmental conditions are the trigger and determinant for acquiring new competencies. Especially since there is limited information available on this topic and the authors are unaware of any specific contributions on it, making it an aspect that urgently needs to be associated with competencies for future competitiveness and employability.

The inherent limitations of a study that is primarily qualitative and based on documentary sources include subjective interpretation and the limited availability of specific studies on the topic. Although this allows for a solid and innovative analysis, it does not offer the potential new insights that could be gained from research employing other qualitative tools such as surveys or interviews, which would generate data and support the central argument and conclusions of the work.

An empirical investigation using surveys or interviews with companies to determine how they value the need for these new competencies, as well as with their current employees to measure their knowledge and adoption of the topic, and with recent university graduates to assess their understanding of the green economy and the current and future job opportunities it offers, would represent a significant

contribution that advances knowledge and addresses the issues qualitatively discussed in this work.

Results and Discussion

Interconnectivity, Climate Change, Biodiversity, and Mitigation Actions

It took a long time, longer than would have been convenient for us humans and other living organisms in the biosphere, to understand that planet Earth is one entity with very complex processes and equally complex interactions. These range from the microscopic level, as seen in the relationships among the millions of organisms that inhabit the soil and are responsible for maintaining its fertility (fungi, bacteria, invertebrates, protozoa), to the macro processes of landwateratmosphere interactions (Rueda, 2024).

For a long time, we studied the Earth, the ocean, and the atmosphere as discrete systems, without understanding them as an indivisible whole that operates through a delicate balance of forces and exchanges. This balance produces the environmental conditions we are accustomed to, which represent our "comfort zone." Under these conditions, we have developed and grown to become the most successful species on the planet, understanding success as our ability to adapt to, live in, and transform almost any place on Earth.

This development accelerated with the industrial revolution, where the use of mechanized processes allowed for the rapid growth of goods production, accompanied by increasingly strong and precise knowledge of science and technology. Today, we are debating the role that artificial intelligence can play in the framework of continuous human development (Smink, 2023).

While this can be interpreted as a success story due to the growth of the human race and all the systems and processes we have invented, it has been based on a linear economy completely dependent on finite natural resources and generating excess waste (solid, liquid, and gaseous). This "success," often measured by countries' GDP, came at the cost of serious environmental transformations, deforestation of terrestrialcoastal ecosystems, and pollution of freshwater and marine ecosystems. These changes have led to the disappearance of hundreds of species from all kingdoms of nature (Rodríguez, 2023).

The mistaken belief that we could "manage" planetary systems as individual units resulted from a lack of understanding of the delicate interactions mentioned earlier, especially the mega connections between ocean and atmosphere.

Science has long been aware of these interactions, from the existence of biogeochemical cycles to the understanding of the water cycle dating back to the 17th century (Steffen et al., 2020). A report from the United Nations Environment Programme (2010) reinforces the concern about this lack of understanding:

"It will be necessary to monitor the changing state of ecosystems, deepen

our understanding of the biological underpinnings of ecosystem services, and develop new tools and techniques to maintain and restore the biological and social resilience of systems, building on the foundations of ecosystems that have been radically altered over the past fifty years."

What may have taken even longer was realizing, and demonstrating, our capacity to affect these cycles and alter the stability of terrestrial ecosystems due to the production and consumption systems we have practiced. Today, we know that we have exceeded some of the planetary boundaries and tipping points of terrestrial and marine ecosystems (UN, 2023) and that some vital ecosystems have been pushed beyond their point of no return, such as the loss of the world's coral reefs (United Nations, 2019). However, the resilience of natural systems can be surprising in their capacity to adapt, as found by Dr. Julia Baum in her research on coral recovery during prolonged heatwaves (Claar et al., 2020).

We were forcibly taught and demonstrated the vital interconnectedness between terrestrial ecosystems and became aware of how much we have impacted them. Additionally, we realized that when a large dynamic system suffers a significant destabilizing impact, such as the melting of polar ice caps; or the atmosphere's capacity to absorb and exchange greenhouse gases (GHGs) with the oceans and land without altering the planet's temperature beyond habitable limits; or changes in land use in the vast forested areas that once existed on the planet some of which still persist but are heavily affected it is expected that the effects of these changes will be of the same magnitude, or even greater, compared to the impact caused. If the impact is large, the expected effects on humans and the biota in general, complicating our situation even further, will be of equal or greater magnitude (Riggio et al., 2020).

These will manifest as major changes in natural and hydrometeorological processes, such as voracious and gigantic fires, megahurricanes, and tropical storms, floods and landslides, or persistent droughts and the advancement of desertification over large land areas. While these changes alter the planet only temporarily on a geological scale, they can radically transform the flora and fauna that currently inhabit it, potentially leading to mass extinctions of species. This poses the greatest current threat to humans and our continued existence on Earth. This is a fact, but a large percentage of the global population has yet to grasp it, which means they do not perceive the high risk to our species' food security (Kaczan & Orgill-Meyer, 2020).

Among the factors mentioned earlier, changes in land use are responsible for the majority of GHG emissions that affect the climate, known as climate change, and concurrently, the loss of biodiversity. The effects of both are the highestrisk factors for human activity.

Until recently, climate change and biodiversity loss were analyzed as separate processes, but today it is accepted that they are completely interconnected. Climate change negatively impacts biodiversity, and the loss of biodiversity exacerbates climate instability, so they must be analyzed, understood, and managed together as they mutually reinforce each other (Metayer et al., 2022).

A study by TRACE X Technologies (2023) on biodiversity and climate change concludes that biodiversity is an essential component of climate action. By

conserving and restoring ecosystems, promoting sustainable agriculture, and supporting ecotourism, we help preserve biodiversity, reduce the impacts of climate change, and maintain the natural reserves required by future generations (Trew & Maclean, 2021).

Some measures that can make significant positive contributions to protecting biodiversity and mitigating climate change, as mentioned in the report, include:

Stopping the loss and degradation of carbon and speciesrich ecosystems on land and in the ocean, especially forests, wetlands, peatlands, grasslands, and savannas; coastal ecosystems such as mangroves, salt marshes, kelp forests, and seagrass meadows; as well as blue carbon habitats in deep and polar waters.

Restoring carbon and speciesrich ecosystems since restoration is one of the cheapest and fastest naturebased climate mitigation measures to implement. This provides muchneeded habitat for plants and animals, thereby enhancing biodiversity resilience to climate change, with numerous other benefits such as flood regulation, coastal protection, water quality improvement, soil erosion reduction, and ensuring pollination (Osuri et al., 2020).

Enhancing sustainable agricultural and forestry practices to improve climate adaptation capacity, enhance biodiversity, increase carbon storage, and reduce emissions. These include measures such as diversifying planted forest and crop species, agroforestry, and agroecology.

Improving and better directing conservation actions, coordinated and supported by strong climate adaptation and innovation. Currently, protected areas account for about 15% of the land and 7.5% of the ocean. However, global needs for effectively protected and conserved areas to ensure a habitable climate, selfsufficient biodiversity, and good quality of life range between 30% and 50% of all oceanic and terrestrial surfaces.

Eliminating subsidies that support local and national activities harmful to biodiversity, such as deforestation, overfertilization, and overfishing.

Conversely, actions to avoid include (Talukder et al., 2022):

- ✓ Planting bioenergy crops in monocultures over large areas of land.
- ✓ Planting trees in ecosystems that have not historically been forests and reforesting with monocultures, especially with exotic tree species.
- ✓ Increasing irrigation capacity.

An Ocean and Climate report (2021) provides examples of oceanbased initiatives using the best available science, developed to safeguard biodiversity while mitigating and/or adapting to the effects of climate change, categorized into four major areas:

- ➢ Protecting and restoring coastal and marine ecosystems.
- ➢ Promoting research, development of scientific approaches, and innovation.

- Enhancing the transition towards lowcarbon societies, territories, and economies.
- Education, awareness, and advocacy.

The transition to lowcarbon economies

Although for many experts this transition to decarbonize the world is not progressing at the necessary speed to avoid surpassing a 2°C increase in global earth temperature by 2030, there is a global effort in innovation for the development of clean energies (Linnenluecke et al., 2019).

The almost exponential increase in the manufacturing of electric vehicles (Geronikolos and Potoglou 2021) has driven electromobility in many parts of the world, in some cases due to "mandatory" decisions such as that of the European Union to eliminate the use of internal combustion vehicles by 2030 (Kalghatgi 2022), and in others by countries strongly committed to decarbonizing their economy, such as China (Li et al. 2022).

The availability of photovoltaic panels at increasingly lower prices has led to solar electricity production becoming competitive with fossil fuelbased electricity such as coal and petroleum derivatives (Mehrjerdi and Rakhshani 2019). The transition to the use of renewable energies such as solar and wind has accelerated substantially, to the point that renewable energies generated a record 30% of global electricity in 2023, and it is believed that: "With the record construction of solar and wind energy in 2023, a new era of declining fossil fuel generation is imminent and 2023 is likely to have been the turning point, marking the peak of emissions in the energy sector (Breyer, 2021).

Likewise, advances in the use of green hydrogen for transportation vehicles such as cars, buses, and ships are increasing (Oliveira, Beswick, and Yan 2021), adding to the positive effect of clean energies by reducing GHG emissions. Furthermore, progress in the design and decision to use stateoftheart nuclear plants (Zhiznin, Timokhov, and Gusev 2020), which considerably reduce the risks of environmental catastrophes like those presented by earlier ones, also contribute to this transition away from the use of fossil fuels and dirty energy sources.

The sum of all the aforementioned actions undoubtedly represents a significant advancement towards substantial reduction in GHG production, which unfortunately is not anticipated to decelerate as soon as necessary. However, it is clear that a global movement towards a new model of green economy is underway, although, regrettably, fossil fuelbased energy is still being used and is likely to remain the primary source of energy production worldwide for several decades (Zhang et al., 2022).

This movement towards lowcarbon economies and towards strengthening the circular economy in substitution of the prevailing linear economy undoubtedly offers a wide range of opportunities to meet the needs that will arise to enhance those models, where new professional and labor competencies will be necessary (Sadiq et al., 2022).

The International Labour Organization (ILO, 2019) confirms that environmental degradation, loss of biodiversity, desertification, sea level rise, and

changes in climate patterns affect how we live, including how we work and earn (Rangaswamy et al., 2023).

Therefore, it promoted a study to understand the implications of transitioning to lowcarbon and resourceefficient economies for competencies, gender, and occupations, taking into account elements such as:

- ✓ The magnitude of the need for professional retraining and capacity enhancement to leverage employment potential in the transition towards environmental sustainability (the "ecological transition").
- ✓ Changes in occupations, skill shortages, and qualifications mismatches to meet the demand for the ecological transition.
- ✓ Specific needs of vulnerable and disadvantaged groups to adapt to change, and effective policy measures to increase productivity and support a just transition.

Below, we list the main results of that study, as they represent the central theme of this analysis and confirm our position that new life skills must change in response to the also changing global landscape towards more decarbonized or green economies. This, in turn, is a wakeup call to higher and technical education sectors, which should anticipate what those new competencies are and how to develop the necessary training actions to seize the new opportunities that will arise, especially in the job market.

The following results from that ILO study provide an overview of the anticipated changes and what we need to prepare for to take advantage of these new circumstances (Silva, 2022):

- ✓ Twothirds of the analyzed countries recognize in their NDCs the importance of capacity development and literacy on climate change, but less than 40% of global NDCs include training plans to support their implementation, and more than 20% do not plan any activities related to human capital.
- ✓ The ecological transition could create millions of jobs but would require significant investments in professional retraining.
- ✓ In the transition towards energy sustainability by 2030, nearly 25 million jobs will be created, and almost 7 million will be lost worldwide. Of these, 5 million can be reclaimed through workforce reallocation, meaning 5 million workers who lose their jobs due to contraction in specific industries can find employment in the same occupation in another industry within the same country.
- ✓ This means that between 1 and 2 million workers are likely to be in occupations where jobs will be lost without equivalent vacancies emerging in other industries, and they will need to be retrained in other occupations. It also means that massive investment will be needed to train workers in the skills required for nearly 20 million new jobs.

- ✓ On the path to a circular economy, a net total of between 7 and 8 million new jobs will be created by 2030, compared to a businessasusual scenario. Expanding these estimates shows that in the circular economy scenario, nearly 78 million jobs will be created, and almost 71 million will be eliminated.
- ✓ Of the workers whose jobs are eliminated, a large proportion amounting to nearly 49 million will find vacancies in the same occupation in other industries within the same country, i.e., through reallocation. As for the rest, nearly 29 million jobs will be created without reallocation, and just under 22 million will be eliminated without vacancies opening in the same occupation in other industries.
- ✓ Only 2% of global jobs are at risk of disruption, but creating over 100 million new jobs is contingent on training, both in the energy sustainability and circular economy scenarios.
- ✓ The transition towards environmentally sustainable and inclusive economies and societies cannot take place if the skills demanded by the new jobs are not available in the current labor market. Therefore, the transition is conditioned on investment in training to develop skills that respond to new needs and avoid skill mismatches.
- ✓ Futureoriented qualification strategies are needed to train young people and retrain the current workforce to meet the skill needs of the new jobs generated in the transition process in expanding sectors.
- ✓ The changing environment, policies and regulations, green technology and innovation, green productivity, and green markets are stimulating the demand for skills for green jobs, both directly and indirectly through supply chains.
- ✓ Green technologies continue to advance, linked to the growth of consumer markets for ecofriendly products and services in highincome countries and increasingly in lowincome countries as technologies become more affordable and efficient, and due to technological diffusion through global trade and investment, as well as increasing awareness of vulnerability to climate change issues and the need to adopt adaptation measures.

The delayed understanding that planet Earth is an indivisible entity with complex processes and relationships has led to a significant delay in our ability to effectively address environmental challenges. The interconnectedness of terrestrial, oceanic, and atmospheric systems has been ignored for a long time, resulting in fragmented management of these systems and severe environmental consequences. Industrialization and economic growth have been made possible by a linear economy dependent on finite natural resources, generating waste and causing deforestation and ecosystem pollution, which has led to the extinction of numerous species.

Historically, climate change and biodiversity loss have been treated as

separate problems, but now it is understood that they are completely interconnected. Climate change negatively affects biodiversity, and biodiversity loss exacerbates climate instability. Conservation and restoration of ecosystems are essential components of climate action, providing necessary habitats for plants and animals and improving ecosystem resilience.

Proposed mitigation actions, such as stopping the loss and degradation of carbon- and species-rich ecosystems, restoring ecosystems, and promoting sustainable agricultural and forestry practices, are essential for reducing greenhouse gas emissions and protecting biodiversity. These measures not only contribute to climate change mitigation but also to flood regulation, coastal protection, and water quality improvement.

Despite the fact that the transition to low-carbon economies is not progressing at the speed necessary to avoid a 2°C increase in global temperature by 2030, there are significant efforts in the innovation and development of clean energy, such as the manufacturing of electric vehicles, solar and wind energy, and the use of green hydrogen. This transition is crucial for reducing dependence on fossil fuels and moving towards a green economy.

The transition to low-carbon economies and the circular economy will generate significant changes in the labor market, creating millions of new jobs and eliminating others. Professional training and skill development will be essential to take advantage of new job opportunities and ensure a just transition. Future-oriented qualification strategies are needed to train young people and retrain the current workforce.

This analysis highlights the urgent need to understand and manage the interconnectedness between climate change and biodiversity loss. Nature-based mitigation actions and the transition to low-carbon economies are crucial to addressing these challenges. Additionally, investment in training and skill development is fundamental to ensure the workforce is prepared for new opportunities in a green economy. Integrated understanding and action are essential to securing a sustainable future for the planet and its inhabitants.

Conclusions

An individual endowed with broad competencies exhibits exceptional adaptability to various environments and emerging challenges, particularly in the realms of work, personal, and social life. It is imperative to cultivate skills in diverse areas, with digital competencies and soft skills being particularly prominent today. However, with the growing relevance of the green economy, new competencies demand our attention.

Findings from the IBERDROLA study underscore the difficulty in finding individuals with soft skills, specifically those focused on problemsolving, teamwork, and leadership. These deficiencies not only apply to current skills but also extend to the competencies needed to address the green transition we are experiencing, which will gain momentum in the years to come and drive the clean economy forward.

The world faces an important challenge that urges us to accelerate transformation to adapt to new circumstances. Changes on our planet are occurring at an unprecedented pace, compelling us to seek innovative and sustainable solutions at that same speed or faster. The green transition emerges as a means to gain valuable time and confront imminent crises.

In this scenario, a dynamic is shaping where there will be winners and losers. Therefore, governmental entities, both at central and local levels, must employ forwardlooking intelligence to identify the risks and opportunities that will arise in this context.

It is incumbent upon academic and technical institutions to incorporate into their agendas the new competencies necessary to meet the demands of this "new world." From a regional perspective, it is essential to recognize the diversity in the vulnerability and adaptability of different regions to the challenges of climate change and environmental degradation. The applicability of these competencies will depend on each region's ability to integrate them into their educational and workforce training systems, taking into account local cultural, human, and socioeconomic characteristics.

In conclusion, success in implementing new competencies to address a climate change environment requires a regionalized approach and comprehensive collaboration among governments, businesses, and society. Continuous education and adaptive workplace training are essential for tackling significant challenges in the coming decades that are constantly evolving.

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About the author Main

Jorge Campos completed his undergraduate studies at the University of Oregon, USA. He is a Biologist graduated from the University of Costa Rica, with a Master's degree in Oceanography from the University of Rhode Island, USA. He has been a researcher at the Center for Research in Marine Sciences and Limnology of the School of Biology, as well as a Professor and full professor at the University of Costa Rica as a member of the Graduate Studies System. He has taught courses in Sustainable Development and Tropical Ecology at VERITAS University. He has served as a consultant in environmental impact studies, resource management, and sustainable development for the IDB, NGOs, and the Ministry of Justice and Peace of Costa Rica. He was a member of the Board of Directors and president of the Costa Rican Institute of Fisheries and Aquaculture. Currently, he is a Professor and researcher in Sustainability initiatives and the Innovation and Associative Entrepreneurship Program of the Institute of Professional Development and Research, as well as the general coordinator of the International Studies Program at FUNDEPOS University.

Declaration of author responsibility

Jorge Campos 1: Conceptualization, Data Curation, Formal Analysis, Research, Methodology, Resources, Software, Supervision, Validation/Verification, Visualization, Writing/original draft, and Writing, review and editing.

Sergio Navas 2: Supervision, Validation/Verification, Visualization, Writing/original draft, and Writing, review and editing.

Francisco Arias 3: Methodology, Resources, software, Supervision, Validation/Verification, Visualization, Writing/original draft, and Writing, review and editing.

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