UNIVERSIDAD DE GRANADA

Programa de Doctorado en Ciencias Económicas y Empresariales.
Departamento de Organización de Empresas I.

TESIS DOCTORAL

EDUCAR EN LA COMPETENCIA PARA EL MUNDO LABORAL 2030. VARIABLES MEDIADORAS Y POTENCIADORAS

Presentada por:
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Dirigida por:
Carmen Haro Domínguez

Granada 2024

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A Julia, su frase "*Lucha por Nuestro Futuro*"

daba sentido a la dedicación plena en esta tesis.

A Raúl, por enseñarme a ver más allá de los datos.

A mis padres por inculcarme el *Aprendizaje Continuo*.

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AGRADECIMIENTOS

Daniel Kahneman decía que cuando nos vemos ante una cuestión difícil, a menudo respondemos a otra más fácil, por lo general sin advertir la sustitución. Y es que realmente, los seres humanos contamos con unos mecanismos sorprendentes para aprender cosas nuevas, para investigar cómo funcionan y para adaptarnos en función de ese conocimiento. Como homenaje, quisiera empezar reconociendo la labor de tantos investigadores que dejan huella, en especial a Kahneman quien me permitió entender el potencial de la psicología y la economía cuando ambas van de la mano para mejorar la vida de las personas.

A la Dra. Haro Domínguez por su confianza, cercanía y cada oportunidad que me ha dado. La primera en 2018, cuando me invitó a presentar mi trabajo sobre Estilos de Pensamiento con su equipo docente. Sin saberlo en aquel momento, ese fue el primer paso para llegar a esta tesis. La travesía nos motivó a proponer un proyecto de innovación que se hizo realidad en plena Pandemia. Aun siendo una época llena de vicisitudes, fue una de las experiencias más motivantes en mi trayectoria profesional porque suponía crear, de la nada, un proyecto nuevo que diera sentido al esfuerzo que docentes y alumnos hacen diariamente por el futuro profesional. Hoy, con la emoción que supone cerrar una trayectoria de 4 años, puedo decir que ha merecido el esfuerzo. Realmente esta tesis es el resultado de cada una de esas oportunidades. Gracias Carmen por vislumbrar que éste fuera parte de mi camino.

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Por último, a los alumnos que participaron en estudios previos y en esta tesis. Como decía Sternberg (1997) no hay unos estilos de pensamiento mejores que otros, simplemente es imprescindible conocerlos para dirigirnos a nosotros mismos con mayor eficacia. En este sentido, recuerdo cada uno de los días de tutorías online y el interés de aquellos que por encima de los resultados querían comprender cómo mejorar. Sinceramente, gracias por permitirme dar fe de ello y trasladar la información a esta tesis. Haré todo lo posible para que un día se lleve a la práctica.

RESUMEN

El objetivo fundamental de esta tesis ha estado dirigido a investigar qué variables favorecen la incorporación al mercado laboral previsto para 2030. Europa insta a las instituciones de Educación Superior a investigar y proponer iniciativas que favorezcan la rápida inclusión laboral de los egresados. Equipar a los estudiantes con conocimientos y habilidades transversales será un hecho en 2030.

En este sentido, comenzamos analizando el contexto donde emergen las competencias clave, su evolución desde diferentes perspectivas y terminamos indicando qué competencias clave son necesarias para enfrentar los desafíos del mercado laboral del futuro 2030. Fundamentado en las políticas de la Unión Europea y apoyado por múltiples estudios globales, el primer capítulo resalta la necesidad de preparar a las futuras generaciones para un entorno laboral en constante cambio, impulsado por avances tecnológicos como la inteligencia artificial y la automatización. Desde la perspectiva del aprendizaje permanente, un mundo donde la tecnología y las prácticas laborales evolucionan rápidamente, la capacidad de aprender y adaptarse continuamente es crucial no solo para los individuos, sino también para organizaciones y sociedades que buscan prosperar en la economía global. La capacidad de los futuros egresados para adaptarse a nuevas tecnologías, metodologías de trabajo y entornos dinámicos puede mejorar cuando las instituciones educativas orientan sus objetivos a lo que el contexto laboral está demandando. Con la inteligencia artificial y otras tecnologías emergentes remodelando la mayoría de los sectores, los futuros trabajadores deben estar equipados con habilidades tecnológicas avanzadas, así como con una comprensión profunda de cómo sus competencias pueden facilitarles la integración y efectividad en sus roles profesionales. En el marco de los Objetivos de Desarrollo Sostenible (ODS) de la Agenda 2030, la educación de calidad (ODS 4), el trabajo decente y el crecimiento económico

(ODS 8), y la reducción de desigualdades (ODS 10) son algunos de los objetivos que mejor se alinean con el desarrollo y la implementación de competencias clave que proponemos a lo largo de esta tesis.

Una vez argumentadas y definidas las competencias clave, presentamos una serie de estudios que relacionan variables individuales con su consecución. El primero de ellos, aborda la relación entre el trabajo colaborativo y el pensamiento creativo, enfatizando en cómo estas competencias clave pueden modelarse desde una perspectiva inclusiva para facilitar la integración de personas con diferentes estilos de pensamiento. Tanto el pensamiento creativo como el trabajo colaborativo son competencias relevantes en las previsiones laborales. En concreto, hemos considerado el pensamiento creativo como la capacidad de desarrollar ideas novedosas y útiles para resolver problemas globales. Está orientado al emprendimiento y la innovación, ya que no tiene sentido generar soluciones innovadoras a problemas complejos si esas soluciones no se ponen en práctica. Esta perspectiva está alineada con el manifiesto presentado por expertos en diversas líneas de investigación sobre la creatividad (Glaveanu et al., 2020) y con la propuesta europea del aprendizaje permanente (Sala et al., 2020). Por otro lado, si el pensamiento creativo se convertirá en una necesidad para la dignidad y la supervivencia de la especie humana, el trabajo colaborativo será imprescindible para llevarlo a cabo. Los resultados del estudio que hemos llevado a cabo con estudiantes universitarios demuestran el importante efecto de su relación en personas con diferentes estilos de pensamiento (Sternberg, 1997). Este aspecto, añade valor al estudio en referencia a cómo identificar variables que favorezcan la inclusión de las diferencias en el contexto educativo y laboral. Aunque la literatura sugiere promover estilos que se ajusten a un perfil creativo, nuestros hallazgos muestran que ciertos factores del trabajo colaborativo como la proactividad, el respeto o

el liderazgo compartido son esenciales para la colaboración creativa, actuando como mediadores para su inclusión.

Por otro lado, hemos profundizado cómo la disposición hacia el pensamiento crítico, una de las competencias clave seleccionadas en este trabajo, influye en la orientación emprendedora individual de estilos intelectuales creativos. Este modelo es novedoso en varios sentidos. Por un lado, la disposición al pensamiento crítico no sólo asegura que las personas estén preparadas para enfrentar los desafíos laborales futuros, sino que además demuestra tener un impacto significativo en la orientación emprendedora de estudiantes universitarios. Tal y como indican las previsiones laborales en 2030, los individuos van a necesitar estar orientados a emprender tanto en iniciativas individuales como cuando sean empleados. Según nuestros resultados, fortalecer el pensamiento crítico favorecería esta disposición. Por otro lado, hemos demostrado en este segundo estudio que no todos los individuos considerados en la literatura como impulsores de creatividad muestran preferencias por llevar sus ideas a cabo de forma autónoma, proactiva e innovadora. Mientras que ciertas preferencias individuales (estilos legislativos y liberales) facilitan a las personas identificar oportunidades, asumir riesgos responsables o ser proactivos para llevar adelante iniciativas innovadoras, otros tipos de preferencias sólo lo consiguen a través del pensamiento crítico. Esto demuestra que educar en la competencia tiene sentido para aquellas instituciones educativas alineadas con favorecer a sus alumnos la consecución de un trabajo decente que propicie el crecimiento económico (ODS 8).

Por último, hemos demostrado cómo las cuatro competencias clave más demandadas en contextos laborales reales, muestran una relación significativa con la digitalización de calidad. Definimos este concepto como la disposición individual para utilizar herramientas y recursos digitales tanto para acceder a una información de calidad como para mejorar el aprendizaje a través de una activa

y colaborativa participación con base en contenido digital. Esta distinción es importante de manera globalizada ya que en la revolución tecnológica que estamos viviendo, tan importante es utilizar y comprender las tecnologías digitales de forma responsable y eficaz, como resolver problemas de forma innovadora a través de la tecnología. Este nivel de competencia digital es el que se demandará en el contexto laboral 2030 y al que Europa insta a las instituciones educativas para que los estudiantes no sólo sean consumidores de contenido digital sino también creadores y pensadores críticos en contextos digitales. En el capítulo cuatro de esta tesis hemos demostrado que las competencias clave tienen un impacto significativo en la digitalización de calidad. Esto pone en valor que la comunicación, el trabajo colaborativo, el pensamiento crítico y creativo potencian nuevas habilidades imprescindibles. Es decir, más allá de los conocimientos de una carrera concreta, los estudiantes van a tener que gestionar su capacidad para comunicarse con claridad, para desenvolverse en contextos colaborativos, aportando soluciones creativas y confiables para lograr trabajar conjuntamente en los entornos digitales. Por otro lado, según muestran los resultados de nuestro estudio, hay variables individuales que predicen la orientación al uso de las competencias clave. Los estilos intelectuales Tipo I nos mostraron cómo las preferencias en el uso de las competencias es una variable a tener en cuenta y tiene un potencial innovador como para incluirlo en el contexto educativo.

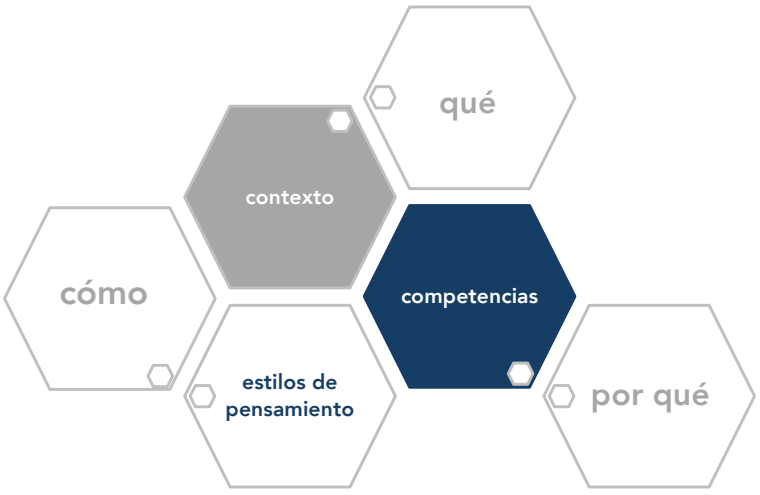
En ese sentido, finalizamos nuestro trabajo con la propuesta de un perfil de competencias y estilos de pensamiento que podría incluirse en el sistema de micro-credenciales propuesto por la unión europea y que probablemente se termine instaurando en 2030. Creemos que con ello damos respuesta a cómo equipar a los estudiantes con herramientas para afrontar su futuro laboral.

Tabla de contenido

Si bien las competencias son fundamentales para el éxito en contextos complejos y cambiantes, los estilos intelectuales determinan cómo las personas las aplican en el mundo real.

(Sternberg, 1997)

Capítulo 1.


qué
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por qué

CAPÍTULO 1 ▹ INTRODUCCIÓN

COMPETENCIAS CLAVE

El propósito fundamental de Europa es contribuir a formar nuevas generaciones comprometidas con los problemas globales, desafíos sociales, políticos, económicos y ambientales establecidos en la Agenda 2030. En esta línea, las competencias clave para el aprendizaje permanente dentro del Marco Europeo de Educación Superior tienen como misión tanto «aprovechar plenamente el potencial de la educación como motor para la creación de empleo, justicia social y ciudadanía activa» como educar en una perspectiva global.

Marco histórico de propuestas de implementación en Educación Superior

Desde la implantación del Plan Bolonia en 1999, el Espacio Europeo de Educación Superior instaba a promover el desarrollo competencial de los universitarios y su capacidad de aprender a aprender de manera activa, autónoma y autorregulada, a lo largo de todo su proceso formativo y durante toda su vida profesional (Alcañiz et al., 2016; Arias y Fidalgo, 2013). En 2005, los responsables de la educación superior adoptaron los Estándares y Directrices para la Garantía de la Calidad de la Educación Superior (ESG). Aunque valoraron avances en algunas líneas de acción del Plan Bolonia 1999, fue en 2006 cuando la UNESCO reafirmó (Declaración de Incheon para la Educación 2030) la necesidad de una educación inclusiva, equitativa de calidad y un aprendizaje a lo largo de la vida para todos, haciendo hincapié en las competencias clave para

el aprendizaje permanente y con ello apoyando el desarrollo de la enseñanza y el aprendizaje orientados a las competencias.

En Europa, la diversidad de perfiles y la necesidad de mejora de las tasas de retención en la educación superior, hizo que se impulsara en 2009 (reunión ministerial de Lovaina) el aprendizaje centrado en el estudiante (Student-centred learning SCL) como una línea de acción. De hecho, el aprendizaje centrado en el estudiante y los resultados del aprendizaje, pasaron a ser parte de la agenda de reforma de Bolonia por recomendación de la European Association for Quality Assurance in Higher Education (ENQA):

> La importancia de los resultados del aprendizaje aumentará por varias razones: (1) los resultados del aprendizaje hacen que las cualificaciones sean más transparentes para los estudiantes; (2) la gama de graduados se amplía y, gracias a los resultados del aprendizaje, los empleadores pueden comprender mejor los conocimientos, habilidades y competencias adquiridos para contratar al candidato más adecuado. (3) los resultados del aprendizaje benefician la garantía de calidad, ya que aumentan la transparencia y la comparabilidad entre los estándares de cualificaciones. Los resultados del aprendizaje también son valiosos en términos de diseño de cursos.

Así fue como en 2015 los Estándares y Directrices para la Garantía de la Calidad en el Espacio Europeo de Educación Superior (ESG) fueron revisados "para mejorar su claridad, aplicabilidad y utilidad, incluido su alcance" y por primera vez incluían, apoyaban y promovían los SCL como estándar:

> "Las instituciones deben asegurarse de que los programas se impartan de una manera que aliente a los estudiantes a asumir un papel activo en la creación del proceso de aprendizaje, y la evaluación de los estudiantes debe reflejar este enfoque".

En mayo de 2018, para promover aún más el desarrollo de competencias clave, el Consejo de la Unión Europea adoptó la Recomendación revisada sobre competencias clave para el aprendizaje permanente, que establece un conjunto básico de habilidades necesarias para trabajar y vivir en el siglo XXI:

> “en un mundo que cambia rápidamente y está altamente interconectado, cada persona necesitará una amplia gama de habilidades y competencias para desarrollarlas continuamente a lo largo de la vida”.

El balance de la importancia de los aspectos del desarrollo personal y social en todos los niveles y sectores de la educación ha recibido una variedad de nombres y marcos como "habilidades del siglo XXI", "habilidades para la vida", "habilidades socioemocionales", "habilidades blandas" o "habilidades transversales". Sin embargo, fue en 2020 cuando Europa publicó el Marco Conceptual de las Competencias Clave para el Aprendizaje Permanente, entendidas como el conjunto de competencias que se aplican a todas las esferas de la vida y que se pueden adquirir a través de la educación formal, informal y no formal para ayudar a los ciudadanos a prosperar en el siglo XXI.

Como puede observarse en la figura 1, la secuencia de resoluciones de la Comisión Europea ha ampliado progresivamente los Marcos Teóricos de Competencias imprescindibles para el avance de los ciudadanos al entorno económico social. LIFECOMP incluye, desde nuestro punto de vista una visión más holística que las anteriores, cuyo objetivo es proporcionar un marco conceptual para la competencia “Personal, Social y para Aprender a Aprender”. La propuesta plantea la base para la discusión como paso previo para adaptarlo en la práctica, implementándolo y evaluándolo en un contexto específico. Con este objetivo se inicia nuestro trabajo para la creación del “Inventario Key Skills – 2030” que parte de las propuestas de Sala et al. (2020).

Figura 1. Adaptado de las Publicaciones de la Comisión Europea. [1]Punie et al, 2013: DIGCOMP; [2]Bacigalupo et al., 2016: EntreComp; [3]Sala et al., 2020: LifeComp

Influencia de la OCDE

En 1987, la OCDE lanza el proyecto INES (Indicadores de Sistemas Nacionales de Educación) con el objetivo de desarrollar indicadores internacionales comparables. Diez años después, en 1997, la OCDE inicia el Proyecto de Definición y Selección de Competencias para crear un marco conceptual y teórico que ayude a identificar las que sean clave para la vida en una sociedad moderna y democrática. En 1998, DeSeCo comienza a analizar proyectos previos relacionados dentro del marco de INES, incluyendo el Proyecto de Competencias Curriculares Transversales (CCC), la Encuesta Internacional de Alfabetismo en Adultos (IALS) y el Proyecto de Indicadores de Capital Humano (HCI). En 1999, se publica el informe "Projects on competencies in the OECD context: Analysis of theoretical and conceptual foundations", que analiza las bases teóricas y conceptuales de competencias en el contexto de la OCDE. En 2001, se publica "Defining and Selecting Key Competencies", proporcionando un marco detallado para definir y seleccionar competencias fundamentales. Fue en 2003 cuando se presenta el informe final del Proyecto DeSeCo, "Key

Competencies for a Successful Life and a Well-Functioning Society", que sintetiza los hallazgos del proyecto y presenta un marco comprensivo para las competencias clave. A lo largo de los años, la OCDE ha seguido influyendo en políticas educativas y evaluaciones internacionales, haciéndose patente su influencia en 2015 con el Programa para la Evaluación Internacional de Estudiantes (PISA) lanzado por la OCDE en el año 2000 y la Encuesta Internacional de Destrezas para la Vida (ILSS), que es parte del Programa para la Evaluación Internacional de Competencias de Adultos (PIAAC) para evaluar las habilidades de los adultos en áreas clave como la alfabetización, la numeración y la resolución de problemas en entornos tecnológicos.

Como muestra la figura 2, ciertos paralelismos pueden encontrarse con los hitos del Proceso de Bolonia, que ha sido fundamental en la creación y desarrollo del Espacio Europeo de Educación Superior (EEES). Aunque en 1988 se firmó la Carta Magna de las Universidades Europeas en Bolonia, no fue hasta 1997 con la Declaración de Lisboa, cuando se buscó el reconocimiento de calificaciones universitarias y la creación de grados y posgrados para permitir a los estudiantes comenzar sus estudios en un país y terminarlos en otro. Un año después, se hizo oficial el compromiso de crear un Espacio Europeo de Educación Superior (EEES), destacando la importancia de una Europa del Conocimiento. En 1999 fue cuando la Declaración de Bolonia, estable las bases del EEES para unificar los sistemas educativos universitarios europeos, facilitando la movilidad de estudiantes y profesores, y asegurando la comparabilidad y compatibilidad de las titulaciones. Décadas después de la Carta Magna, en 2010, se creó oficialmente el Espacio Europeo de Educación Superior (EEES), lo que marcó la culminación de los esfuerzos del Proceso de Bolonia que buscaba asegurar sistemas de educación superior compatibles y coherentes en toda Europa. La creación del EEES estableció un marco común para la educación superior en Europa, facilitando la movilidad académica y profesional. Será en 2015, cuando

se plantea el reconocimiento automático de títulos, la mejora de la calidad a través de la innovación pedagógica y la adecuación de las competencias al mercado laboral.

Figura 2. *Hitos Institucionales, adaptado de las publicaciones oficiales oecd.org y education.ec.europa.eu.*

Cinco años después, 2020 es un hito transcendental en la historia de la humanidad. La pandemia Covid-19 afectó a todos los sistemas educativos del mundo. Aquellos países que habían acelerado previamente sus recursos digitales pudieron mantener sistemas de aprendizaje en línea, pero la calidad de éste se vio afectada en estudiantes de todo el mundo (Hollister et al., 2022). Según el análisis bibliométrico de Aristovnik et al. (2023) tres años después del inicio de la Pandemia, el aprendizaje en línea se está volviendo cada vez más popular y ha llegado para quedarse si ofrece nuevas oportunidades de aprendizaje.

Contexto 2020 y previsiones para 2030.

Desde 2020, todos los informes de McKinsey Global Institute relacionados con las previsiones del futuro laboral fueron revisados para realizar esta tesis.

Comparándolos con otras publicaciones europeas, nos ha permitido contrastar si efectivamente nuestro objetivo tenía un paralelismo con la realidad de cada momento y las propuestas de futuro globales. De ello observamos que el rápido ritmo de transformación iniciado por la pandemia significó que las organizaciones debieron adaptarse más rápido que nunca, desarrollando las habilidades adecuadas para sostener ese cambio. La publicación The Future of Work after Covid-19 en 2021, que examinó el impacto a largo plazo en ocho economías con diversos mercados laborales, mostró que: (1) Consideraciones de salud y seguridad era un nuevo factor que configuraba el futuro del trabajo. (2) El trabajo remoto híbrido aumentaba en 25 % de los trabajadores en las economías avanzadas y alrededor del 10% en las economías emergentes. (3) El comercio electrónico fue de dos a cinco veces más rápido en 2020. (4) Las transiciones de la fuerza laboral pueden ser mayores en escala de lo que se estimaba antes de la pandemia. En sus previsiones para 2030 se considera que la posibilidad de cambiar de ocupación aumentara hasta un 25% más en las economías avanzadas y con ello la redistribución rápida y eficaz de los trabajadores, mediante la contratación y reciclaje basados en habilidades/competencias y experiencia en lugar de títulos académicos. En sus conclusiones destacaban que 107 millones de trabajadores pueden "necesitar" cambiar de ocupación en 2030 y para ello las instituciones educativas precisan formar a los futuros egresados en habilidades personales que favorezcan estas transiciones.

El último informe de McKinsey en 2023 evoluciona en referencia al anterior en tres aspectos importantes para el objetivo de nuestro trabajo: (1) La adopción del trabajo remoto y los modelos híbridos se ha consolidado, con las organizaciones ajustando sus operaciones para soportar estos formatos de manera sostenible, enfatizando la importancia de la claridad estratégica y el desarrollo de habilidades de gestión como el coaching y la empatía. (2) La

aceleración en la adopción de tecnologías digitales y de automatización que comenzó con la pandemia continúa, mostrando que las empresas siguen buscando integrar nuevas tecnologías para optimizar los resultados y fortalecer la toma de decisiones basada en datos. (3) En lo referente a la diversidad, equidad e inclusión, en el informe de 2021 se reflejó que la pandemia afectó desproporcionadamente a las poblaciones diversas y se propuso que la equidad digital y nuevas formas de movilidad ocupacional eran cruciales. Aunque en el informe de 2023, se sigue resaltando la necesidad de hacer de la diversidad una prioridad y mejorar la inclusividad para permitir que todos los empleados prosperen, se puede deducir que sigue siendo una prioridad que no se consigue afrontar a nivel global. Vuelven a ser las transiciones "upskilling" y "reskilling" ante los cambios tecnológicos, lo que requiere un enfoque de gestión del talento más ágil y adaptativo. En el capítulo cuatro exploraremos en más profundidad cómo abordar una Digitalización de Calidad enfocada a ello.

Creando Sinergias

La Agenda 2030 para el Desarrollo Sostenible reconoce el papel fundamental de educación para que todos los alumnos adquieran los conocimientos y las habilidades necesarias que les permita tener un futuro de vida sostenible con una visión de ser ciudadanos globales (Meta 4.7, Educación 2030, Declaración y Marco de Acción de Incheon). Aunque este objetivo no tuvo el alcance deseado en el plazo fijado de 2015, el Consejo Europeo también acordó que para 2020, el 40 % de los jóvenes tendrían un título de educación superior o equivalente y que el 20 % de estos estudiantes pasarían un período de estudios en el extranjero. La UE ayudó con fondos del Banco Europeo de Inversiones y el Fondo Europeo para Inversiones Estratégicas entre otros, para desarrollar la capacidad infraestructural. La Comisión Europea también proporcionó estudios, análisis y

proyectos de innovación que reúnen a socios e instituciones de educación superior a través de los programas de financiación Horizonte 2020 y Erasmus+. Tres objetivos clave centran actualmente las futuras acciones de la UE a favor de la educación superior: (1) Priorizar desajustes de habilidades. (2) Inclusividad y conectividad para contribuir a la innovación. (3) Cooperación entre redes de universidades europeas como parte del Espacio Europeo de Educación. Como es evidente, Europa sigue insistiendo en garantizar una educación inclusiva y equitativa de calidad que promueva oportunidades de aprendizaje permanente para todos (ODS 4-Educación). Uno de los propósitos de esta tesis ha sido incluir esta perspectiva para contribuir de alguna manera a ello.

Aunque nuestro trabajo se centra en el Marco Europeo, también se han tenido en cuenta propuestas como las publicadas por *Center for Curriculum Redisign (CCR)* para tener una perspectiva global. Como dice Dweck (2015) en la presentación de Four-Dimensional Education: "*Necesitamos hacer un estudio muy reflexivo de las competencias que nuestros estudiantes necesitan para prosperar en el mundo de hoy y del mañana*". Como puede observarse en la figura 3, la propuesta CCR subrayaban la necesidad de un enfoque educativo integral que desarrolle no solo el conocimiento, sino también las habilidades, el carácter y las capacidades metacognitivas de los estudiantes para prepararlos adecuadamente ante los desafíos del siglo XXI. El enfoque integraba cuatro dimensiones: (1) Conocimiento, involucrando tanto el conocimiento tradicional de disciplinas clásicas como nuevas áreas interdisciplinarias relevantes para el mundo actual, como la actualización continua para reflejar el estado actual del conocimiento y las necesidades del mercado laboral. (2) Habilidades como la Creatividad para generar ideas nuevas y valiosas, el Pensamiento Crítico para analizar y evaluar información y argumentos de manera lógica y coherente, la Comunicación para expresar ideas de manera efectiva, tanto de forma oral como escrita y la Colaboración para alcanzar un objetivo común. (3) Carácter sabiendo

que las habilidades pueden desarrollarse con esfuerzo y práctica (Mentalidad de Crecimiento), teniendo la capacidad de recuperarse de los desafíos y mantener la motivación (Resiliencia), actuando con integridad y tomando decisiones éticas para guiarse a uno mismo y a otros (Ética y Liderazgo) y estando abiertos a nuevas experiencias y puntos de vista de los que aprender continuamente (Curiosidad y Mentalidad Abierta). (4) Meta-aprendizaje entendido como un proceso de metacognición individual que la habilidad de Reflexionar sobre el propio proceso de aprendizaje, evaluar estrategias y ajustarlas para mejorar, la Capacidad de adaptarse a nuevas situaciones y desafíos a través del aprendizaje continuo y la actitud de mejora constante y superación personal.

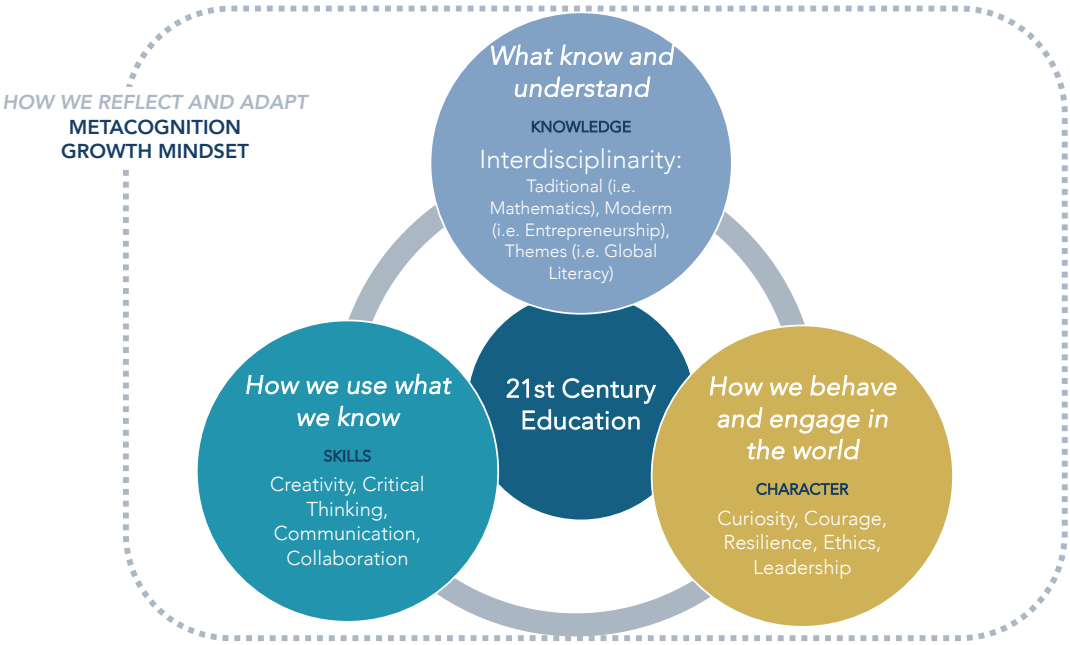

Figura *3.* Adaptado de la propuesta de Dweck, C. (2015) en la presentación de Four-Dimensional Education (CCR).

Desde el enfoque de la Unión Europea (Sala et al., 2020) se plantea que las competencias clave ayudan a los individuos a desarrollarse como personas completas, agentes sociales responsables y aprendices reflexivos a lo largo de la

vida. Estas competencias, tanto en la educación formal, informal y no formal, prepararán a los ciudadanos para enfrentar los desafíos complejos del mundo actual y futuro. La figura 4 muestra las dimensiones que se incluyen en la propuesta europea y que se definen como: (1) Área Personal que incluye la conciencia y gestión de las emociones, pensamientos y comportamientos (Autorregulación), la capacidad de gestionar transiciones e incertidumbre, y enfrentar desafíos (Flexibilidad) y la búsqueda de la satisfacción en la vida, cuidado de la salud física, mental y social, y adopción de un estilo de vida sostenible (Bienestar). (2) Área Social donde son relevantes la comprensión de las emociones, experiencias y valores de otra persona, y la provisión de respuestas apropiadas (Empatía), el uso de estrategias de comunicación relevantes, códigos específicos del dominio y herramientas, dependiendo del contexto y el contenido (Comunicación) y la participación en actividades grupales y trabajo en equipo, reconociendo y respetando a los demás (Comunicación). (3) Área de Aprender a Aprender en la que son imprescindibles la Mentalidad de Crecimiento, el Pensamiento Crítico para evaluar la información y plantear argumentos que apoyen conclusiones razonadas con el fin de desarrollar soluciones innovadoras. Además, en esta área, la Gestión del Aprendizaje se favorece: planificando, organizando, evaluando y revisando cómo hacerlo más eficaz.

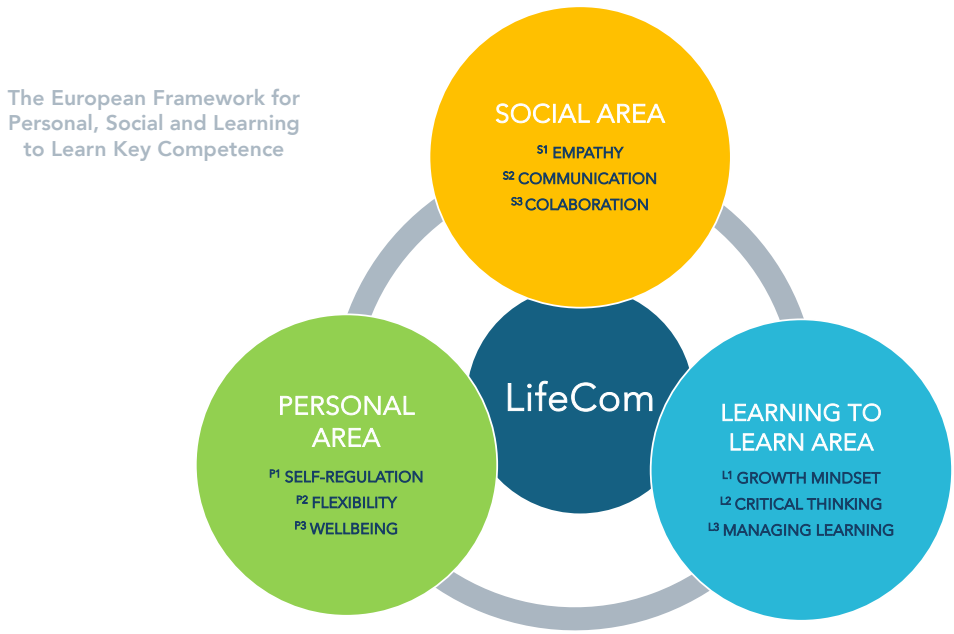

Figura 4. Adaptado de European Commission, Joint Research Centre (Sala et al. (2020).

Por último, en este apartado enfocado a crear sinergias entre diferentes perspectivas, creemos importante incluir el análisis de Dondi et al. (2021) quienes argumentan que las habilidades que los ciudadanos necesitarán en el futuro mercado laboral no solo permitirán a los ciudadanos agregar valor más allá de lo que pueden hacer los sistemas automatizados e inteligentes, sino también operar de manera efectiva en un entorno digital y adaptarse continuamente a nuevas formas de trabajo y ocupaciones emergentes. El informe identificó como elementos fundamentales de talento cuatro categorías principales: (1) Competencias Cognitivas como la escucha activa, la formulación de preguntas correctas, la narración, la oratoria pública, y la síntesis de mensajes (Comunicación), el razonamiento lógico, la búsqueda de información relevante, la resolución estructurada de problemas y la comprensión de sesgos (Pensamiento Crítico), la capacidad de aprender, adaptabilidad, adopción de diferentes perspectivas, creatividad e imaginación, y la traducción de

conocimientos a diferentes contextos (Flexibilidad Mental) y el pensamiento ágil, la gestión del tiempo y la priorización, y el desarrollo de planes de trabajo (Planificación y Métodos de Trabajo). (2) Competencias Digitales usadas de manera colaborativa y ética, el uso y desarrollo de software y la comprensión de Sistemas Digitales. (3) Competencias Interpersonales que permitan el Desarrollo de Relaciones basadas en la empatía, la confianza, la humildad y la sociabilidad, la Movilización de Sistemas que permita tener una visión y conciencia organizacional, el intercambio de roles y la negociación, el Trabajo en Equipo con habilidades de inclusión de diferentes personalidades o la resolución de conflictos. (4) Autoliderazgo para la comprensión de las propias emociones y fortalezas que generen la automotivación y la autoconfianza, la orientación al Logro de Metas con tenacidad y persistencia para afrontar la incertidumbre o tomar de decisiones. (5) Emprendimiento para el impulso de cambio e innovación.

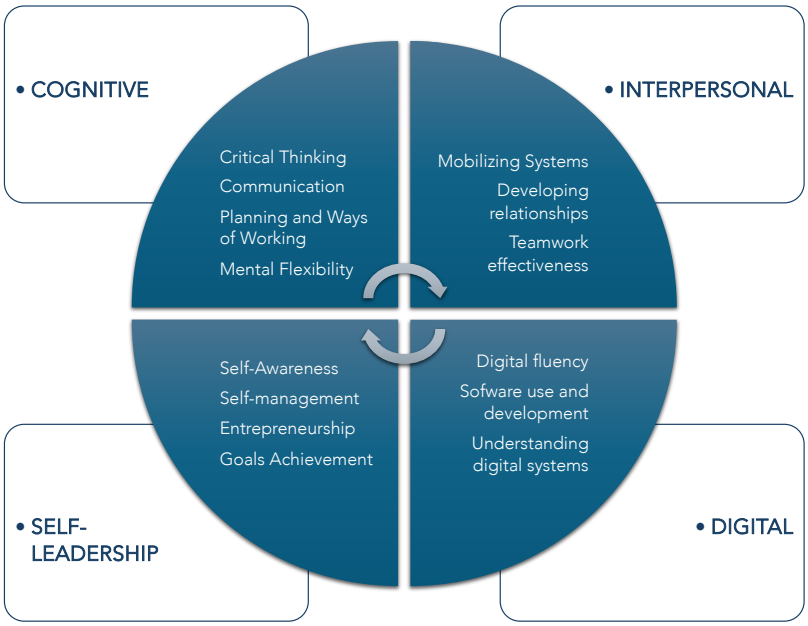

Figura 5. Adaptado de Mckinsey and Co. (2021) Defining the skills citizens will need in the future world of work. McKensey Global Institute.

Todos los enfoques abarcan un amplio espectro de habilidades, coincidiendo en la necesidad de centrar la atención tanto en las Competencias Clave (Pensamiento Creativo, Pensamiento Crítico, Comunicación, Trabajo Colaborativo). Otras variables como podría ser la Autogestión se contextualizan de manera diferente en cada aproximación, lo que exploraremos con más detalle en el capítulo 4 y 5.

COMPETENCIAS CLAVE SELECCIONADAS

Teniendo en cuenta los análisis anteriores, las competencias clave que se han utilizado en los siguientes estudios se muestran en la Figura 6. El Pensamiento Creativo se consideró como la capacidad de desarrollar ideas novedosas, sintetizar y combinar conceptos e información de distintas fuentes, llevándolas a la práctica para resolver problemas (Sala et al., 2020). Abarca dimensiones como la innovación para el desarrollo de nuevas soluciones y el emprendimiento para ponerlas en práctica (López-Cárdenas and Haro-Domínguez, 2024)

Figura 6. Competencias Clave para el mundo laboral 2030. Elaboración propia.

El Pensamiento Crítico, como la capacidad de gestionar adecuadamente problemas complejos, intercambiar puntos de vista, asumir posiciones razonadas y llegar a conclusiones basadas en evidencias (Sala et al., 2020), incluye dimensiones como comparar, analizar, evaluar y sintetizar para obtener conclusiones lógicas. En la Comunicación se consideraron las dimensiones de la escucha activa, el empleo de métodos de comunicación efectiva y multilingüe para adaptarse a todo tipo de audiencia y contexto. Siguiendo a Sala et al. (2020) es una competencia clave que implica la capacidad para escuchar y transmitir información, adaptando los mensajes según la audiencia, el contexto y con el propósito de promover la inclusión y el respeto en todo tipo de interacciones multiculturales. Por último, el Trabajo Colaborativo implica la capacidad de coparticipar en actividades y emprendimientos colectivos, y de animar a otros a colaborar, poniendo en común conocimientos, competencias y recursos, para poder alcanzar un objetivo común. Adaptabilidad, proactividad, liderazgo compartido y respeto fueron las dimensiones que se tuvieron en cuenta (López-Cárdenas and Haro-Domínguez, 2024). La autogestión, aun considerándose clave en el aprendizaje permanente se evaluó de manera independiente a las otras cuatro competencias (capítulo 4) ya que las anteriores por sí mismas pueden ser la base necesaria para sustentar la autogestión tal y como indica la Teoría de la Autodeterminación (Ryan and Deci, 2000). Aunque la Autogestión ha sido analizada desde diferentes perspectivas en la literatura, para Sala et al. (2020) implica la capacidad de comprender cómo las emociones, los pensamientos y los valores influyen en el comportamiento para regularlos en un esfuerzo sostenido y de manera constructiva a lo largo de la vida.

ESTILOS DE PENSAMIENTO

Respecto a las variables cognitivas que pueden mediar en la ágil adquisición de nuevas competencias a medida que la tecnología evoluciona y nos adentramos en la perspectiva laboral prevista para 2030, la Teoría del Autogobierno Mental (Sternberg, 1988) es el marco teórico que mejor se ajusta y relaciona en la literatura con muchas de las variables individuales incluidas en las perspectivas de Dweck (2015), Sala et al. (2020) y Dondi et al. (2021). Empleando la estructura del gobierno como metáfora, Sternberg trazó un paralelismo entre la forma en que gobernamos nuestro comportamiento. La teoría parte de 13 estilos de pensamiento agrupados en cinco dimensiones (Sternberg, 1997): función (estilo legislativo, judicial, ejecutivo), forma (estilo monárquico, jerárquico, oligárquico, anárquico), nivel (estilo global, local), alcance (estilo interno, externo) e inclinación (estilo liberal, conservador). Centrándonos en la función, las personas con preferencias por decidir por sí mismas qué hacer y cómo hacer las cosas se ajustan a un estilo legislativo. Aquellos que prefieren tareas con estructuras claras para seguir patrones establecidos se ajustan a un estilo ejecutivo, y aquellos que prefieren tareas de evaluación, ya sea de procesos de trabajo u objetivos, se ajustan a un estilo judicial. Como puede observarse en la tabla 1, cada uno de los estilos difiere entre sí permitiendo distinguir diferencias cognitivas que pueden generalizarse a diferentes contextos.

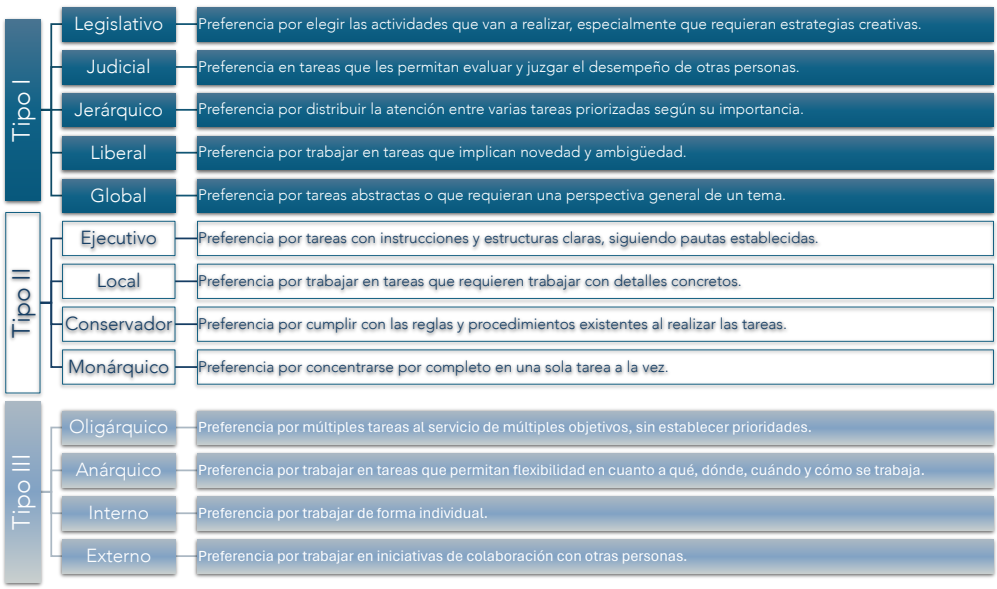

Tabla 1. Clasificación de los Estilos de Pensamiento en función de las dimensiones de Estilos Intelectuales. Adaptado de Zhang and Sternberg (2005).

La evolución de la teoría (Zhang, Sternberg y Rayner, 2012; Zhang y Sternberg, 2005) y el resultado de los estudios empíricos, permiten constatar que ciertos estilos se han relacionado consistentemente. Esto llevó a una reagrupación en lo que se denomina "estilos intelectuales" y se clasifican en Tipos I, II y III.

Según la naturaleza de los estilos intelectuales (Zhang and Sternberg, 2006): Los Tipo I se caracterizan por preferencias hacia tareas con bajos grados de estructura, que requieren un procesamiento de información más complejo, y que permiten originalidad y altos niveles de libertad para hacer las cosas a su manera. Basado en descripciones de estilos específicos en varios modelos y en hallazgos de investigaciones existentes, su enfoque está orientado al aprendizaje profundo y holístico. Estos estilos son generalmente apreciados en contextos ambiguos que precisan atributos humanos creativos para adaptarse o avanzar, a diferencia de los estilos tipo II, que son percibidos como menos deseables por su preferencia hacia un aprendizaje superficial que simplemente requiera transmisión de información. Sin embargo, los estilos intelectuales

tipo II, desempeñan un papel importante en contextos estructurados y tradicionales por lo que reconocer su valor y encontrar maneras de fomentar su adaptabilidad beneficiaría tanto a ellos mismos como a las organizaciones. Los estilos intelectuales Tipo III combinan características de los estilos Tipo I y Tipo II, adaptándose a las demandas de una tarea específica y al interés del individuo. Quizás por esta razón son menos interesantes en el ámbito de la investigación, ya que las metodologías educativas que se propongan a los dos anteriores pueden beneficiarles igualmente.

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Por qué considerar los estilos de Pensamiento

Según Sternberg (1997) los estilos de pensamiento, como preferencias en el uso de las habilidades, permiten comprender cómo personas con igual aptitud pueden desenvolverse de manera diferente en función de la correspondencia entre su estilo y el contexto. Explican con claridad la forma diferente en que las personas afrontamos los desafíos en el mundo real que las aptitudes no pueden explicar. Sus indicadores de valor y maleabilidad (Zhang 2015), además de universalidad, permiten discriminar diferencias cognitivas que pueden generalizarse a diferentes contextos y culturas, lo que es un objetivo importante para el propósito de este trabajo. Su conocimiento permitiría a un individuo, comprender cómo se siente más cómodo ante una elección en un contexto determinado (Groza et al., 2016) o cómo mantener una actitud distinta hacia un comportamiento específico (Zhang, 2021). En tal caso, parecen ser los candidatos perfectos para predecir la orientación del comportamiento de los individuos.

Además, lo que hace que la teoría sea aún más interesante para nuestro estudio es la universalidad y maleabilidad de estas preferencias, lo que permitiría proponer estrategias educativas tanto para facilitar su integración como para fomentar una tendencia hacia un estilo más adaptativo. La tabla 2, muestra las relaciones previas que se valoraron antes de llevar a cabo los estudios que se presentan en los siguientes capítulos.

Estilos	Implicación Práctica	Desafíos Potenciales	Estrategias Educativas	Impacto en Trabajo en Equipo
Tipo I	Situaciones que requieren creatividad, investigación innovadora, entornos educativos que fomentan el pensamiento crítico.	Dificultad para adaptarse a entornos altamente estructurados o tareas que requieren conformidad estricta.	Métodos y programas de formación en pensamiento creativo y ejercicios de resolución de problemas.	Influencia positiva en la innovación en equipos, pero potencial fricción en equipos que prefieren estructura.
Tipo II	Roles que requieren precisión, atención al detalle y adherencia a procedimientos establecidos (posibles candidatos en gestión de calidad).	Resistencia al cambio, dificultad para innovar en entornos cambiantes.	Técnicas de pensamiento flexible, exposición gradual a tareas más abiertas.	Contribuyen a la estabilidad y el orden en equipos, pero pueden resistirse a enfoques creativos y colaborativos.
Tipo III	Roles multifuncionales, contextos con cambios frecuentes de enfoque.	Falta de consistencia, indecisión debido a la naturaleza adaptable.	Programas de desarrollo que equilibren adaptabilidad con desarrollo de competencias específicas.	Facilitan mediación y flexibilidad en equipos, pero pueden generar conflictos por su naturaleza cambiante.
	Evaluación y Medición	**Impacto Personal y Profesional**	**Cultura y Contexto**	**Futura Investigación**
Relevancia	Métodos ágiles para evaluar cada estilo, incluyendo cuestionarios, análisis de comportamiento y autoevaluaciones.	Influencia en desarrollo de carrera, oportunidades profesionales y crecimiento personal.	Impacto de factores culturales y contextuales en la prevalencia y efectividad de cada estilo.	Intervenciones que favorezcan el estilo Tipo I. Estudios longitudinales sobre Adaptabilidad y Resiliencia de los estilos Tipo II. Potenciales de los tres estilos en contextos tecnológico colaborativos.

Tabla 2. Distinciones entre Estilos Intelectuales y relevancia para esta Tesis. Adaptado de Sternberg (1988, 1997); Zhang and Sternberg (2006); Zhang (2013, 2015, 2017).

Cuestiones iniciales para plantear los modelos e hipótesis.

Una vez identificas las competencias clave y los estilos de pensamiento como ejes de esta tesis, se valoró si su investigación podría tener un impacto con los Objetivos de Desarrollo Sostenible 2030. La Tabla 3 refleja las reflexiones iniciales sobre las cuales se plantearon los modelos y las hipótesis de los siguientes estudios:

- ¿Los estilos de pensamiento modulan la percepción de las competencias clave imprescindibles para 2030? En caso afirmativo, se confirmaría el modelo de la Teoría del Autogobierno Mental con respecto a la influencia de los estilos de pensamiento en la adquisición de competencias (Sternberg, 1988).

- ¿Cómo podemos favorecer la adquisición de las competencias Clave en aquellas personas con preferencias de estilo Tipo II? En cualquier entorno coexisten personas con diferentes preferencias a la hora de gestionar la

información o su comportamiento, es decir diferentes estilos de pensamiento. La riqueza de la diversidad forma parte de nuestro enfoque sostenible por lo que buscar los ejes que mejoren la competencia, respetando esas diferencias, se hace imprescindible en nuestro estudio.

- ¿Cómo ayudarían la competencia y el estilo de pensamiento al emprendimiento o la autogestión de aprendizajes complejos en el contexto tecnológico previsto? Si los estilos de pensamiento y las competencias están relacionados, puede que ambos favorezcan a las personas para tomar decisiones más emprendedoras o a gestionarse para abordar el entorno tecnológico de una manera más efectiva.

Competencia en el Marco Europeo	Descriptores	Estilo Intelectual	Posibles Relaciones para Establecer Hipótesis	Relevancia en la Agenda 2030
Pensamiento Crítico (L2)	L2.1, L2.2, L2.3	**Tipo I**	Prefieren tareas autónomas, críticas y creativas. El estilo legislativo sería crucial para estas competencias.	Innovación y educación de calidad (ODS 4); Crecimiento económico (ODS 8); Reducción de desigualdades (ODS 10)
Pensamiento Creativo (L2)	L2.3		El estilo judicial fomentaría el análisis crítico y la evaluación de diferentes perspectivas.	Innovación y educación de calidad (ODS 4); Crecimiento económico (ODS 8)
Comunicación (S2)	S2.1, S2.2, S2.3		El estilo judicial por su preferencia al cuestionamiento podría tener dificultades.	Reducción de desigualdades (ODS 10)
Colaboración (S3)	S3.1, S3.2, S3.3		El estilo Legislativo estaría más orientado a crear la dirección del equipo	Educación inclusiva y equitativa (ODS 4)
Autogestión del Aprendizaje (L3)	L3.1, L3.2, L3.3		El estilo global aporta su enfoque en el panorama general y la integración de conocimientos. El estilo jerárquico priorizaría estrategias en función de la relevancia o dominio.	Desarrollo continuo y crecimiento personal (ODS 4)
Mentalidad de Crecimiento (L1)	L1.1, L1.2, L1.3		El estilo liberal, con su apertura al cambio y la exploración de nuevas ideas, se alinea con el desarrollo de una mentalidad de crecimiento.	Innovación y educación de calidad (ODS 4)
Flexibilidad para gestionar transiciones e Incertidumbre (P2)	P2.1, P2.2, P2.3	**Tipo II**	El estilo local, con su atención a los detalles y la ejecución de tareas concretas, podría beneficiarse al desarrollar una mayor flexibilidad.	Reducción de desigualdades (ODS 10)
Autoregulación para manejar Emociones, Pensamientos y Comportamiento (P1)	P1.1, P1.2, P1.3		El estilo conservador, con enfoque en la estabilidad y el orden, podría beneficiarse del desarrollo de habilidades de autorregulación.	Bienestar y salud mental (ODS 3)
Gestión del Aprendizaje (L3)	L3.1, L3.2, L3.3		El estilo ejecutivo encajaría en la implementación de objetivos, si estos estuvieran PREVIAMENTE DEFINIDOS.	Gestión estructurada de proyectos (ODS 8)
Colaboración (S3)	S3.1, S3.2, S3.3		El estilo Ejecutivo aún no tomando la iniciativa se beneficiaría por modelamiento.	Educación inclusiva y equitativa (ODS 4)
Autoregulación para Manejar Emociones, Pensamientos y Comportamiento (P1)	P1.1, P1.2, P1.3		El estilo conservador puede beneficiarse del desarrollo de habilidades de autorregulación para manejar el cambio y la incertidumbre.	Bienestar y salud mental (ODS 3)

Tabla 3. Potenciales relaciones entre la Competencia en el Marco Europeo, el Estilo Intelectual y los Objetivos de Desarrollo Sostenible 2030.

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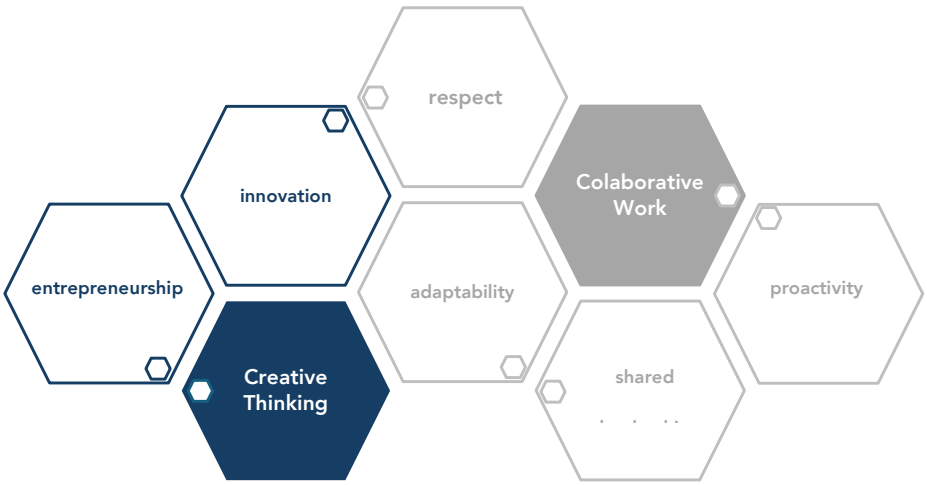
El Pensamiento Creativo se convertirá en una necesidad para la dignidad y la supervivencia de la especie humana (Glaveanu et al., 2020)

Capítulo 2


respect
innovation
Colaborative Work
entrepreneurship
adaptability
proactivity
Creative Thinking
shared

CAPÍTULO 2 ▷ COLLABORATIVE WORK AND CREATIVE THINKING ORIENTED TO ENTREPRENEURSHIP AND INNOVATION. AN INCLUSIVE MODEL OF THINKING STYLES.

ABSTRACT

In facing the labor predictions for 2030, future graduates will need to reinvent themselves creatively to be open to entrepreneurship and innovation from any discipline. Research shows that people with creative confidence are better oriented to this challenge. This study examines the important relationship between collaborative work and creative confidence, demonstrating its effect on different thinking styles. Regardless of gender or academic major, the mediation results suggest that respect, proactivity, and shared leadership in collaborative work enhance the relationship between styles not previously associated with creative confidence. The study was performed with students enrolled in the Faculty of Economic Sciences and Business of the University of Granada. Partial least squares structural equation modeling was used, as this method is recommended for complex non-parametric exploratory studies.

INTRODUCTION

The changes that have occurred following the pandemic have accelerated predictions about labor changes, indicating inequalities and competences for lifelong learning as one of the key debates (International Labor Organization, 2021). Along these lines, predictions stress that all persons must update their competences to respond to the demands of the new, constantly changing labor

market (OCDE, 2021). To drive more flexible itineraries that enable development of competences needed to face the post-pandemic challenges, Europe indicates the importance of considering learning in all contexts—form, nonformal, and informal—and in all stages of life (Sala, Punie and Garkov, 2020). Now more than ever, workers will have to be active participants in identifying their own competences and the resources and support they need to do their work or collaborate with their companies to achieve them (Pietenpol, 2020; World Economic Forum, 2021).

Within this framework of predictions, universities must equip their students with agile tools that enable them to find solutions to both individual and global problems (Brundiers et al., 2021; European Commission, 2022, 2021, 2020; Hoshmand and Chung, 2021; Ivetic and Ilić, 2020). Innovating and engaging in entrepreneurship with creative thinking adds value beyond the value that can be produced by automated systems and intelligent machines (Dondi et al., 2021). As early as 2019, academics at different universities came together to draft a joint manifesto on a new conceptual framework of creativity, in which they indicated that creative thinking would become a necessity for the dignity and survival of the human species (Glaveanu et al., 2020). We could understand this manifesto in the context of the predictions for 2030, in which most workers will need to change occupation, seeking jobs in occupational categories completely different from those for which they are now preparing or in which they worked previously (Lund et al., 2021; World Economic Forum, 2020; Smit et al., 2020).

Future leaders will need continuous creative renewal to respond to the general demands of a sustainable society (McKinsey and Co., 2021; Billing et al., 2021; Frenton et al., 2021; World Economic Forum, 2021; Moritz, 2020; United Nations, 2015) in which development of artificial intelligence will enable tremendous innovations. Although the "exogeneous shock" (McCleskey and Gruda, 2021) of the pandemic showed that perception influenced empowered leadership

significantly (Han et al., 2022), we know from the behavioral economy (Tversky and Kahneman, 1974; 1992) that people in a situation of threat weigh potential loss more than gains. The next decade risks being just as challenging (Lund et al., 2021). In considering how perceptual systems that limit individuals' behavior are nourished (Kahneman, 2011), creative self-concept can provide creative activity and achievements in all areas of the general population (Lebuda et al., 2021).

Our study forms part of a broader project that seeks to strengthen the key competences in university contexts to respond to the demands of the new, constantly changing labor market. We believe creative thinking is one of the most relevant of these competences for exploring new ideas and evaluating new problem-solving strategies (Sternberg, 2021; Maker, 2021; Lucas and Spencer, 2017; Amabile et al., 2004). In fact, within the new paradigm of competences for lifelong learning, creative thinking is considered as the skill that any person can develop to generate valuable and innovative results (Sala et al., 2020; Glaveanu et al., 2020; Cachia et al., 2010). Thus, in university environments, where we wish to educate leaders who make a difference in the world (UNESCO, 2021; Amabile, 2019; Lozano et al., 2013; Sternberg and Vroom, 2002), responsibility for encouraging both technical skills and creative competences for innovation and entrepreneurship becomes crucial (Yu, Shin-Jia and Tien-Chi, 2020). When we focus on university students' academic results, we strengthen fit with the external criterion of an evaluator—that is, we look toward more extrinsic motivation (Amabile, 1998; Amabile et al., 2004; Amabile et al., 2005). When we orient ourselves both to students' preferences when processing information and creative decision-making and to their competence, we are more likely to encourage their intrinsic motivation (Amabile and Kramer, 2011; Amabile and Pratt, 2016). Since the nature of the perceived challenges is related to movements to adapt that people make to overcome these challenges (Berg, Wrzesniewski

and Dutton, 2010), people who identify the key competences for facing the future are likely to redirect their behavior and make better decisions (Bolzan de Rezende et al., 2021; Zhiguo et al., 2019; Evans and Waring, 2015; Evans and Vermunt, 2013; Tversky and Kahneman, 1974). As Sternberg (1999) indicates, "Perception of what you think you know can be as important as what you really know." When people recognize their preferences and feel competent, they are probably more open to solving real problems that make a positive difference in the world (Kelley and Kelley, 2013; Amabile, 2019).

THEORETICAL BACKGROUND AND HYPOTHESES

Creative Thinking as Competence

The European Commission adopted the term "key competences for lifelong learning," including creative thinking among them (European Commission, 2021). Although competences change their taxonomy from some disciplines to others (Sánchez, Valerio and Bernal, 2016), they are present in studies on business, management, and education (Kipper et al., 2020; Elliot and Dweck, 2018). In the economics literature, the importance of training in competences plays a central role in analyses of economic growth (International Labor Organization, 2021b; McKinsey and Co., 2021, 2020; Agrawal et al., 2020; ESCO, 2019), regardless of whether competences are measured with behavioral indicators or measures of self-efficacy (Lundberg, 2017; Heckman, Jagelka and Kautz, 2021; Heckman and Kautz, 2012; Heckman, Stixrud and Urzua, 2006; Chua, 2017).

Creative thinking as a competence—a dependent variable in our study—is defined as the capability to develop novel ideas and to synthesize and combine

concepts and information from different sources to solve problems (Sternberg and Chowkase, 2021; Sala, Punie and Garkov, 2020).

Seeking inclusivity (SDGs 4, 8, 10), our study starts from the idea that any person can develop skills to generate valuable and innovative results (Lucas and Spencer, 2017; Cachia et al., 2010; Glaveanu et al., 2020) through deliberate effort and practice (Hochanadel and Finamore, 2015). To achieve this goal, universities must focus the curriculum to achieve creative competence (Glaveanu, 2020; Sun and Hui, 2012) that encourages agile adaptation to the work world. To this end, we introduce innovation and entrepreneurship in our study (Yu, Shin-Jia and Tien-Chi, 2020; Schumpeter, 2000; Swedberg, 2000). If we want anyone to contribute value to make a difference in the next decade (Amabile, 2019), we must foster competences such as creative thinking, which generate novel original ideas that are useful and sustainable (Sala, Punie and Garkov, 2020). Such competences must be grounded in the intention to innovate—to introduce, modify, promote, and implement these ideas (Huges et al., 2018)—and entrepreneurship as an integral part of a new business spirit driven by new challenges (Haddad, Haddad and Nagpal 2021; Shi, 2022).

This approach implies understanding the importance of "deciding to be" (Sternberg, 2003), since we must be motivated, especially by intrinsic goals, such as personal challenge or one's own evolution (Amabile, 1993; Sternberg and Lubart, 1995). To cultivate creative competence in university environments, as well as encourage the context that facilitates acquisition of this skill, we must include creative self-concept (Beghetto and Karwowski, 2017; Karwowski, Lebuda and Wiśniewska, 2018; Karwowski, Lebuda and Beghetto, 2019). Clear knowledge of what we need for an uncertain future facilitates dedication in the face of challenge, sharpens how we face new obstacles, and thus encourages a growth mentality (Dweck, 2010; Chen et al., 2020). Further, in the paradigm of being active participants in identification and management of our competences

(Pietenpol, 2020), people's underlying beliefs about their creative capability acquire vital importance (Aronson and Steel, 2005). It is not just a matter of the skills one has, but of the judgments about what one can do with any skill one possesses (Bandura, 2012, 1993). Beliefs matter (Manalo and Kapur, 2019) and we thus believe that self-evaluation of the competence appears to have validity and enables us to understand our students better to evaluate their progress (Lucas, Claxton and Spencer, 2013).

Collaborative Work as Competence

In the future, when connectivity and human-machine interfaces consolidate the learning of both parties, collaborative work will benefit workers, who will abandon repetitive tasks to focus on working with knowledge (Mahlmann et al., 2021). To contribute growth, sustainability, and inclusion (Sternfels et al., 2021), individuals will need to collaborate in identifying and fostering any aspect of their creativity (Sternberg, 2019; Jhon-Steiner, 2000). We observed proof of this situation during the pandemic, where talent set in motion collaboratively enabled people to find innovative solutions to problems to which we had never been exposed (McKinsey and Co., 2020b; Spangler, 2022). We must thus encourage transformative creativity through collaboration with a common goal, for a global good (Sternberg, 2021).

Applying this perspective to the university context, our conceptualization of the competence "collaborative work" goes beyond focusing on students' relationship to and integration into a group (Car and Walton, 2014; Le Boterf, 2018, 2008). As recent publications on the work future indicate (De Smet, Gagnon and Mygatt, 2021; Agrawal et al., 2021), we need people with collaborative competences to guarantee that professional ties remain strong despite distance. These competences will also be crucial for leaders who attempt to drive change,

as these leaders will have to focus on connecting teams and identifying with other informal leaders to strengthen this connection (Brassey et al., 2022). Should we thus include collaborative competence as a fundamental competence associated with creative thinking? If solving problems within a single discipline is already complex, "macro problems" require contributions from different disciplines. They require creative individuals to broaden their field of vision beyond a dogmatic mindset (Ambrose and Sternberg, 2011). Creative success emerges from functionally diverse teams that work in environments where members can debate and refine problems and solutions (McKaya, Reiter-Palmonb and Kaufman, 2021). Our study thus considers collaborating competently to involve proactively assuming responsibilities and functions of shared leadership, contributing to improving and developing the team with adaptability, and maintaining respect for the different personalities that compose it (Cirella and Murphy, 2022; Cirella, 2021; Johnson and Johnson, 2021; Yström and Agogué, 2020). Based on this argumentation, we propose:

H1 - Collaborative work will have an important effect on creative thinking.

Only so will we be prepared for the next decade, when developing high-quality distance capabilities will be global and leadership of collaborative teams will come to be shared not only by those who have technical skills but also by those who have skills to inspire others in situations of high vulnerability (Dondi et al., 2021; Law et al., 2019).

It is thus important that we communicate clearly about what we expect from students who work collaboratively—all the more so because we know how important "micro-practices" (that is, what we do every day) are in initiating, maintaining, and generalizing successful collaboration in the future (Faccin et al., 2020; Ankrah et al., 2013). Instructors play a truly crucial role as intermediaries in

the development of collaborations (Du, Leten and Vanhaverbeke, 2014; Tether and Tajar, 2008).

Thinking Styles and Creative Thinking

Studies of how certain thinking styles encourage creative thinking (Tam, Phillipson and Phillipson, 2022; Ytterstad and Olaisen, 2021; Yu, Shin-Jia and Tien-Chi, 2020; Kandemir et al., 2019; García et al., 2017; Sadeghi and Hasani, 2014; Dikici, 2014; Erkan, 2013; Gutierrez-Braojos et al., 2013; Zhu and Zhang, 2011; López and Martín, 2010; Sofo, 2008; Sun and Lau, 2006; O'Hara and Sternberg, 2001) and of how universities should foster them (Kaufman, Glaveanu and Sternberg, 2019; Zhang, 2015; Sternberg, 2011; Jones and Reid, 2007) lead us to ask how different thinking styles are related to creative thinking, where creative thinking is defined as a construct composed of innovation and entrepreneurship. Our study aims to contribute to this knowledge.

We are all creative due to the need to adapt to problems as they arise for us and in situations where the usual responses do not work (Glaveanu et al., 2020). This study therefore proposes that, when struggling with unique situations like those predicted (McKinsey and Co., 2021; Agrawal et al., 2020), people with legislative thinking styles will agilely develop competences such as creative thinking. These people show greater openness to challenges when they face a problem, propose new solutions to problems or situations, and take advantage of the resources they have. They use their own ideas and strategies to face new challenges and feel motivated by testing their ideas and ways of doing things. Ultimately, they are the perfect candidates to develop creative thinking in the environments of entrepreneurship and innovation that artificial intelligence will facilitate by 2030.

Executive style, with its clear tendency to follow established rules, will not show an agile relationship to creative competence. This style's tendency to confirm

which methods or procedures it should use before starting a task or project does not facilitate entrepreneurship and innovation. Oddly enough, although this profile would seem to fit less well into the uncertain work environments predicted for 2030, it is the style most rewarded in university contexts, which primarily reward following the rules established by instructors.

Judicial styles, which focus more on evaluation, will be creatively competent in innovation processes, due to their preference for confirming and evaluating different ways of doing things. This preference will enable people with judicial thinking styles to discover and understand work procedures for innovation due to their preference for confirming and evaluating different ways of doing things. When it is a matter of engaging in entrepreneurship, however, such people may be paralyzed by their tendency to analyze advantages and opportunities in situations of uncertainty, even though their attitude is constructive and positive when they face changes and difficulties.

In conclusion, we hypothesize that:

H2 – The legislative thinking style is positively related to creative thinking.

H3 – The executive thinking style is negatively related to creative thinking.

H4 – The judicial thinking style is positively related to creative thinking.

Thinking Styles and Collaborative Work

Given the social aspect of human interaction, questions of cooperation and competence are inherent in learning (Johnson and Johnson, 2021) and in our daily decision-making (Sofo et al., 2013b). The preferred ways of processing information and facing tasks influence decision-making, from individual to group (Volpentesta et al., 2009; Sternberg, 2008). Thinking style is one of the cognitive processes involved in giving meaning to the environment and deciding on

suitable action (Sofo et al., 2013), potentially influencing collaborative management (Camarinha-Matos, Paraskakis and Afsarmanesh, 2013; Klein et al., 2009; Ollus et al., 2009; Salas et al., 2008; Yström and Agogué, 2020). Note that variables such as the group's environment interact differently with individual traits in solving problems (Tromp and Sternberg, 2022). Studies that tie thinking styles to collaborative work have focused either on exploring differences between styles (Sofo, 2008) or on how some styles predict whether collaborative work will function better (Jung et al., 2021). In creative environments, diversity of thinking styles among individuals involved in a collaborative project is fundamentally responsible for the tension that leads to conflict, but at the same time it provides the most effective creative solutions (Volpentesta, Ammirato and Sofo, 2010, 2011). What differentiates entrepreneurial from social individuals in the environment of entrepreneurship—even though both types prefer to work in environments where they can interact with others—is that entrepreneurs enjoy assuming leadership roles in their collaborative efforts (Zhang, 2021).

If cooperation arises when shared action occurs to achieve a desired objective, how will different thinking styles interact with this competence? When collaborative work involves focus on creating new ideas to solve common problems, such styles will appear as proactive in the group to provide new ideas; they will feel comfortable when someone must assume leadership and adapt better to sharing it—even to undertaking the actions needed to carry out these ideas. Executive style positively influences development of collaborative work, but to a lesser extent than legislative, as these styles contribute to the group by following rules and adapt properly as long as they feel respected. They will find it difficult, however, to create new ideas and share leadership. Finally, judicial style positively influences collaborative work, since it prefers contrasting different perspectives and shows its talent in evaluating and comparing both rules and procedures. Including these styles in teams will facilitate correction and control

of the team's mistakes. One potentially limiting issue in this relationship is the level of criticism, which can affect others, depending on how respectful their opinions and judgments are.

In conclusion, we hypothesize that:

H5 – The legislative thinking style is positively related to collaborative work.

H6 – The executive thinking style is positively related to collaborative work.

H7 – The judicial thinking style is positively related to collaborative work.

Mediating Effect of Collaborative Work

As we explained throughout the theoretical review, creativity and collaborative work will go hand in hand in the coming decade to solve real problems and make a positive difference in the world (Dondi et al., 2021; Agrawal et al., 2020; Moneta et al., 2010). These abilities will provide transformational creativity to solve global problems (Sternberg, 2021, 2002) in a collaborative environment that provides innovation and entrepreneurship (Cirella and Murphy, 2022; Cirella, 2021). We thus reason that collaborative work can encourage development of creative thinking as a competence in styles for which this relationship has not previously been established. That is, collaborative work improves the relationship of executive and judicial styles to creative thinking without negatively affecting the relationship hypothesized above between legislative style and creative thinking.

Finally, we hypothesize that:

H8 - Collaborative work preserves the relationship between legislative thinking style and creative thinking.

H9 - Collaborative work improves the relationship between executive styles and creative thinking.

H10 - Collaborative work improves the relationship between judicial styles and creative thinking.

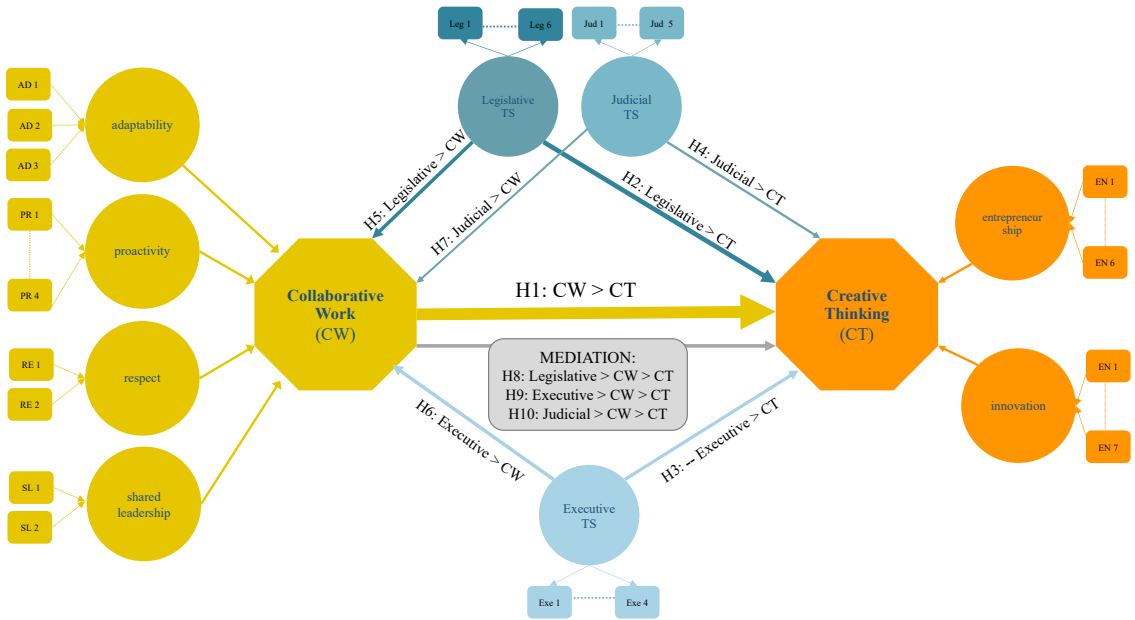


Figure 1. Proposed Conceptual Model.

METHODOLOGY

Sample and procedure

The study was conducted with 208 undergraduate students from different academic programs (Table 1 for the sample analyzed), enrolled in business creation courses in the Faculty of Economics and Business Sciences of the University of Granada (academic year 2020/2021). About 1,300 students enrolled in the business creation subject were invited to participate freely through the university's individualized email system. Just over 500 showed interest in

participating in the Project, however, there were 208 who managed to complete the entire process. The thinking styles studied were Legislative, Executive and Judicial. The competences studied were Creative Thinking and Collaborative Work. Students first completed the thinking styles questionnaire. Once we obtained the student profiles, we administered the competences questionnaire.

The data had been obtained from the respondents themselves and the constructs used represent subjective measures. To decrease or eliminate common method bias, clear questionnaire instructions were provided to respondents. These included communicating that there were no correct answers and that all responses would be kept anonymous. Redundancy of items was avoided to increase respondents' motivation. We sent the two questionnaires at two separate times, because this technique helps to erase measurement-related clues and to improve accuracy of responses. We proceeded to perform two tests. First, Harman's single factor test, which is recommended and widely used in the literature (Podsakoff et al., 2003). To do this, we loaded all variables into exploratory factor analysis, restricting the number of factors to 1. The first component represented less than 50% of all variables (19,503%), so common method variance is not a serious problem in our sample. Second, we have performed an exploratory factor analysis for the first-order constructs, which showed four first-order factors with eigenvalues > 1.0 representing 66,992 % of the variance. Since no single factor emerged and the first factor did not explain most of the variance. For all these reasons, we reached the same conclusion as in the previous test. The results of both tests confirmed the variance of the common method is not a problem in the sample.

Table 1. Characteristics of the sample

Respondent D	208	%		208	%
Gender			Education		
Female	133	64%	GADE	77	37.02%
Male	75	36%	GMIM	35	16.83%
Age			GECO	25	12%
18 -20	84	40.38%	GTUR	17	8.17%
21-22	70	33.65%	GFICO	13	6.25%
23- 49	54	25.96%	GADE-Law	21	10.10%
Year in program			GADE-Engir	20	9.61%
1	44	21.15%			
2	33	15.87%			
3	57	27.40%			
4	62	29.81%			
5	12	5.77%			

Source: Own elaboration using Excel. GADE: Degree in Business Administration and Management; GMIM: Degree in Marketing and Market Research: GECO: Degree in Economics; GTUR: Degree in Tourism; GFICO: Degree in Finance and Accounting; GADE-Law: Double Degree in Business Administration and Management and Law; GADE-Engineering: Double Degree in Business Administration and Management and Engineering.

Measurements

Creative thinking and collaborative work were evaluated with the "Key Skills-2030 Inventory" (Sala et al., 2020; Podsakoff et al., 2003) and thinking style using the "Thinking Styles Inventory" (Sternberg, 1997). For both, we used a 7-point Likert scale (1= Completely disagree to 7=Completely agree). The control variables were degree program, gender, and year in program.

Analytic Strategy

We modelled the relationships proposed using structural equations and Smart PLS software (v. 3.3.3). PLS works better with small data samples, like those

employed in this study, than do covariance-based SEM techniques. However, our sample size permits us to estimate the proposed model (Benítez-Amado et al., 2015). The variables legislative thinking style (Legislative-TS), executive thinking style (Executive-TS), and judicial thinking style (Judicial-TS) represent individuals' preferences when they use their skills, process information, and orient their behavior (Sternberg, 1997). The literature has classified these variables as reflective (Hair et al., 2019; Henseler, 2017), whereas collaborative work (CW) and creative thinking (CT) are second-order formative constructs (Sarstedt et al, 2019).

RESULTS

Measurement model

Following the steps for validation of a measurement scale (Vargas-Halabí el al., 2017), we tested reliability or internal consistency, convergent validity, and discriminant validity for the first-order measurement model (Table 2). First, in reflective variables, the indicators are considered adequate when they show a loading (**λ**) above 0.7 for they respective construct although the loadings may also be considered if they are higher than 0.6 and significant (Benítez-Amado et al., 2015). The Alpha Cronbach and Composite Reliability, took values above 0.7, ensuring reliability or internal consistency (Hair et al., 2019). The loadings could also be considered if they were higher than 0.6 and significant (Benítez-Amado et al., 2015). Dijkstra-Henseler's Rho_A values were above 0.7, ensuring correlation among the constructs estimated reflectively (Dijkstra and Henseler, 2015). AVE values above 0.5 guaranteed convergent validity at construct level (Gefen et al., 2000) and high correlation among the constructs estimated reflectively (Dijkstra and Henseler, 2015). As Table 2, shows the Fornell-Larcker

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Table 2. Measurement model with first-order reflective variables.

Reliability and convergent validity for first-order reflective variables					
Construct/ Items	Individual Reliability	Cronbach's α	Rho_A	Composite Reliability	AVE
Legislative Thinking Style (Legislative-TS)					
1. When I make decisions, I tend to rely on my own ideas and ways of thinking to do the th	0.668				
2. When I face a problem, I use my own ideas and strategies to solve it.	0.723				
3. Tike to play with my ideas and see how far they go.	0.711	0.804	0.814	0.859	0.505
4. I like problems that allow me to test my own way to solve them.	0.666				
5. When I work on a task, I like to start with my own ideas.	0.691				
6. I like situations where I can use my own ideas and shapes of doing things.	0.741				
Executive Thinking Style (Executive-TS)					
1. When expressing or writing ideas, I follow formal rules of presentation.	0.748				
2. I try to use the appropriate method to solve any problem.	0.821	0.788	0.91	0.856	0.601
3. Before starting a task or project, I check which method or procedure must be used.	0.728				
4. I like to figure out how to solve a problem by following rules established.	0.742				
Judicial Thinking Style (Judicial-TS)					
1. I like to test and evaluate opposing ideas or points of view.	0.85				
2. I like projects where I can study or evaluate different ideas and points of view.	0.847				
3. When making a decision, I like to compare opposing points of view.	0.859	0.905	0.911	0.93	0.726
4. I like situations where I can compare and evaluate shapes different ways of doing things.	0.882				
5. I enjoy jobs that involve analyzing, evaluating or companing things.	0.759				

Discriminant validity for first-order reflective variables			
Fornell-Larcker Criterion			
	Legislative-TS	*Executive-TS*	*Judicial-TS*
Legislative-TS	0.711		
Executive-TS	0.226	0.775	
Judicial-TS	0.523	0.258	0.852
Ratio HTMT			
	Legislative-TS	*Executive-TS*	*Judicial-TS*
Legislative-TS			
Executive-TS	0.262		
Judicial-TS	0.612	0.262	

Source: Sternberg, R.J., 1997. Legislative-TS: Legislative thinking style. Executive-TS: Executive thinking style. Judicial-TS: Judicial thinking style. Own elaboration using Smart-PLS.

Second The formative measurement models (Table 3) were evaluated following the criteria in (Hair et al., 2017). We assessed multicollinearity. The most common is the variance inflation factor (VIF), which must be less than or equal to 3.3 (Hair et al., 2019). Third, to assess relevance (magnitude), the maximum value for the weight of a set of formatives (uncorrelated) indicators of a construct is $1/\sqrt{n}$, where n is the number of indicators. Our model fulfilled this condition for all items except for two of them.

Table 3. Measurement model with first-order formative variables.

Multicollinearity (VIF) // Evaluation of weights of formative variables < 1/√ (n)			
Construct / Items	VIF	Weights	relative contribution weights < 1/√(n)
Creative Thinking Entrepreneurship Dimension (CT-EN)			
CT-EN 1. I analyze advantages and opportunities of the changes produced in a situation	1.8	0.403	CT_EN < 0.408
CT-EN 2. To face new challenges, I readjust my expectations, modifying ideas or procedures.	1.8	0.302	
CT-EN 3. In the face of changes and difficulties, I show an attitude constructive and positive	1.6	0.179	
CT-EN 4. I don't need an external requirement to launch actions that respond to specific needs and improveme	1.2	0.115	
CT-EN 5. I put new ideas into practice, integrating concepts and procedures I learn.	2.1	0.238	
CT-EN 6. I constantly evaluate opportunities to develop my creative potential.	1.8	0.079	
Creative Thinking Innovation Dimension (CT-IN)			
CT-IN 1. I like to test my ideas and see how far they go.	2.4	0.057	CT_IN < 0.370
CT-IN 2. I propose new solutions to problems or situations.	2.7	*0.392	
CT-IN 3. I take advantage of available resources to propose strategies and/or projects.	2	0.127	
CT-IN 4. I take the initiative in classes where actions are taken novel.	1.6	0.003	
CT-IN 5. I combine knowledge from different areas to propose changes or new adaptations.	2.5	0.127	
CT-IN 6. I am motivated to discover and understand work procedures other groups or different areas.	2	0.139	
CT-IN 7. I look for new actions that contribute to the improvement of my work or around.	2.2	0.356	
Collaborative Work Adaptability Dimension (CW-AD)			
CW-AD 1. I adapt to the roles, norms and functioning of my team job.	1.8	0.408	CW_AD < 0.57
CW-AD 2. I am realistic, regarding my tasks and the collective ones, when I work collaborative way.	1.7	0.424	
CW-AD 3. I develop academic and/or research projects in multidisciplinary teams.	1.1	0.46	
Collaborative Work Shared Leadership Dimension (CW-SL)			
CW-SL 1. Achieving common objectives is key in group work.	1.1	*0.756	CW_SL < 0.707
CW-SL 2. I coordinate with shared and rotating leadership.	1.1	0.437	
Collaborative Work Proactivity Dimension (CW-PR)			
CW-PR 1. I contribute my ideas and knowledge to contribute to the effectiveness of the equipment.	3.3	0.315	CW_PR < 0.5
CW-PR 2. I exchange information and share my resources in groups job.	2.9	0.368	
CW-PR 3. I mobilize other people in the design and development of a plan performance.	1.5	0.175	
CW-PR 4. I co-evaluate the development and results obtained in my group's work.	1.6	0.34	
Collaborative Work Respect Dimension (CW-RE)			
CW-RE 1. I believe in the potential of diversity.	1.5	0.526	CW-RE < 0.707
CW-RE 2. I take individualities into account when I coordinate a team.	1.5	0.604	

Source: Own elaboration of "Key Skills-2030 Inventory" based on reports consulted in Sala, A., Punie, Y. & Garkov, V. (2020); Agrawal, S., De Smet, A., Lacroix, S. & Reich, A. (2020); Dondi, M., Klier, J., Panier, F. & Schubert, J. (2021). Own elaboration using Smart-PLS.

Finally, the factor weights of the indicators were evaluated with a Bootstrapping process, in which the indicators must have a significance greater than 0.05, although (Hair et al., 2017) recommend including the indicator in the model so as

not to lose the meaning of the construct measured. As Table 4 shows, collaborative work as a second-order construct was composed of: adaptability (CW-AD), shared leadership (CW-SL), proactivity (CW-PR) and respect (CW-RE). Creative thinking was composed of creative thinking directed towards entrepreneurship (CT-EN) and creative thinking directed towards innovation (CT-IN). The coefficient of determination R2 is considered high when R2 ≥ 0.2 for analyses of variables on behavioral preferences (Hair et al., 2019). Predictive accuracy was thus high for creative thinking (R2=0.741) and moderate for collaborative work (R2=0.162).

Table 4. Measurement model with second-order formative variables.

Multicollinearity and relative contribution (weights (1 / √n).									
2° order variables	VIF	Weights	relative contribution weights < 1/√(n)	Sample mean (M)	Std. deviation (STDEV)	t-statistics (|O/STDEV|)	p-values	5.0%	95.0%
Collaborative Work (CW)									
CW-AD	2.091	0.139	TC < 0.5	0.144	0.09	1.548	0,06	-0,004	0,293
CW-SL	2.363	0.17		0.168	0.087	1.941	0,027	0,021	0,304
CW-PR	2.59	0.472		0.47	0.088	5.338	0	0,326	0,621
CW-RE	1.737	0.382		0.376	0.084	4.527	0	0,231	0,512
Creative Thinking (CT)									
CT-EM	3.26	0.531	PCRE < 0.707	0.527	0.092	5.798	0	0,413	0,735
CT-IN	3.26	0.514		0.516	0.088	5.812	0	0,305	0,624

Evaluation of loadings							
	Original sample (O)	Sample mean (M)	Std. deviation (STDEV)	t-statistics (|O/STDEV|)	p-values	5.0%	95.0%
CW-AD	0.764	0.759	0.059	12.892	0	0,658	0,848
CW-SL	0.809	0.804	0.041	19.708	0	0,727	0,865
CW-PR	0.921	0.916	0.027	34.474	0	0,869	0,955
CW-RE	0.843	0.838	0.039	21.789	0	0,768	0,897
CT-EN	0.959	0.958	0.013	71.716	0	0,942	0,985
CT-IN	0.956	0.954	0.02	47.212	0	0,9	0,977

Source: Own elaboration using Smart-PLS. CT-EN: Creative Thinking-Entrepreneurship. CT-IN: Creative Thinking – Innovation. CW-AD: Collaborative Work – Adaptability. CW-SL: Collaborative Work – Shared Leadership. CW-PR: Collaborative Work – Proactivity. CW-RE: Collaborative Work – Respect.

Structural model

To evaluate the quality of the structural model, we performed a bootstrapping test with 10,000 subsamples and two tails. As table V shows, the value SRMR for the saturated model was 0.047 and for the estimated model 0.048, indicating that the SRMR shows good fit to validate and explain the data analyzed (Benítez el al., 2020) . Collinearity analysis of the constructs (VIF≤ 3) indicated absence of bias (Hair et al., 2019). Following (Cohen, 1988), collaborative work was distinguished by its relevance in explaining creative thinking (H1). The significance of the path coefficient tells us that the relationships estimated in Hypotheses H1, H2, H5, H6 and H7 are appropriate. Path coefficient showed a negative relationship in H3 and positive in H4, although were non-significant. The Hypothesis H8, H9 and H10 were confirmed showing path coefficients with different levels of signification. The control variables, gender and degree program were not significantly related to creative thinking, but year in program showed a small-scale significant relationship.

Table 5. Structural model evaluation.

Hypothesis Testing							
Hypothesis	**VIF**	**β**	**t-values**	**Confident Intervals**		**f2**	**Decision**
Collaborative Work related to Creative Thinking				**2.5%**	**97.5%**		
H1 CW > CT	1.408	0.794***	21.567	0.717	0.863	2.012	Suported
Thinking styles related to creative thinking							
H2 Legislative TS > CT	1.491	0.129*	2.362	0.022	0.237	0.044	Suported
H3 Executive TS > CT	1.236	-0.01	0.205	-0.101	0.083	0	Suported
H4 Judicial TS > CT	1.472	0.022	0.047	-0.073	0.108	0.001	Suported
Thinking styles related to collaborative work							
H5 Legislative TS > CW	1.392	0.189*	2.51	0.056	0.347	0.03	Suported
H6 Executive TS > CW	1.084	0.172*	2.286	0.04	0.331	0.033	Suported
H7 Judicial TS > CW	1.416	0.177*	1.991	-0.002	0.348	0.026	Suported
Collaborative Work Mediation							
H8 Legislative TS > CW > CT		0.150*	2,544	0,045	0,274		Suported
H9 Executive TS > CW > CT		0.137*	2,22	0,271	0,026		Suported
H10 Judicial TS > CW> CT		0,142*	1,994	-0,002	0,275		Suported
Control Variables							
Course	1.38	0.079*	2.05	0.001	0.153	0.023	
Gender	1.091	0.077	1.034	-0.072	0.218	0.005	
Grade	1.113	-0.002	0.05	-0.073	0.07	0	
Overvall Fit							
SRMR Model	Original sample (O)	Sample mean (M)	95%	99%			
Saturated	0.047	0.04	0.047	0.05			
Estimated	0.048	0.042	0.049	0.052			

Notes: One-tailed test *p<0.05 **p<0.01 ***p<0.001

Source: Own elaboration using Smart-PLS. Legislative-TS: Legislative thinking style. Executive-TS: Executive thinking style. Judicial-TS: Judicial thinking style. CW: Collaborative Work. CT: Creative Thinking.

Mediation Analysis

The indirect effect of collaborative work on the relationship between thinking styles and creative thinking confirmed Hypotheses H8, H9 and H10 (Table VI). According to (Hair et al., 2019), analysis of the Variance Accounted Factor (VAF) suggests a total mediation of collaborative work in thinking styles not previously related to creative thinking. Mediation was partial in legislative style.

Table 6. Indirect Effects and Coefficient of Determination.

Indirect Effects	Original sample (O)	Sample mean (M)	Std. deviation (STDEV)	t-statistics (|O/STDEV|)	p-values	2.5%	97.5%	VAF	mediation
H8 Legislative > CW > CT	0,15	0,16	0,06	2,528	0,011	0,045	0,274	0.537	partial
H9 Executive > CW > CT	0,137	0,15	0,061	2,257	0,024	0,032	0,271	10.787	total
H10 Judicial > CW > CT	0,142	0,14	0,071	2,002	0,045	0,002	0,275	0.864	total

R-squared	Original sample (O)	Sample mean (M)	Std. deviation (STDEV)	t-statistics (|O/STDEV|)	p-values	2.5%	97.5%
Collaborative Work (CW)	0.162	0.19	0.053	3.077	0.002	0.096	0.301
Creative Thinking (CT)	0.741	0.752	0.037	20.12	0	0.675	0.818

Source: Own elaboration using Smart-PLS

About the result, we confirm that collaborative work showed a positive relationship to creative thinking, as it is higher through proactivity, respect and shared leadership than through adaptability. Second, we confirm that significant differences exist between thinking style and creative thinking as oriented to entrepreneurship and innovation. More specifically, legislative thinking style was positively related to creative thinking; executive thinking style was negatively related and the judicial style positively, although both were not significant. Third, we confirm that significant differences exist between thinking style and collaborative work, where legislative and executive thinking style show better significance than judicial. Finally, we confirm that executive style and judicial style become positively related to creative thinking through collaborative work, specifically through respect and proactivity. Legislative thinking style continued to show a positive relationship to creative thinking through respect, proactivity, shared leadership and adaptability in collaborative work.

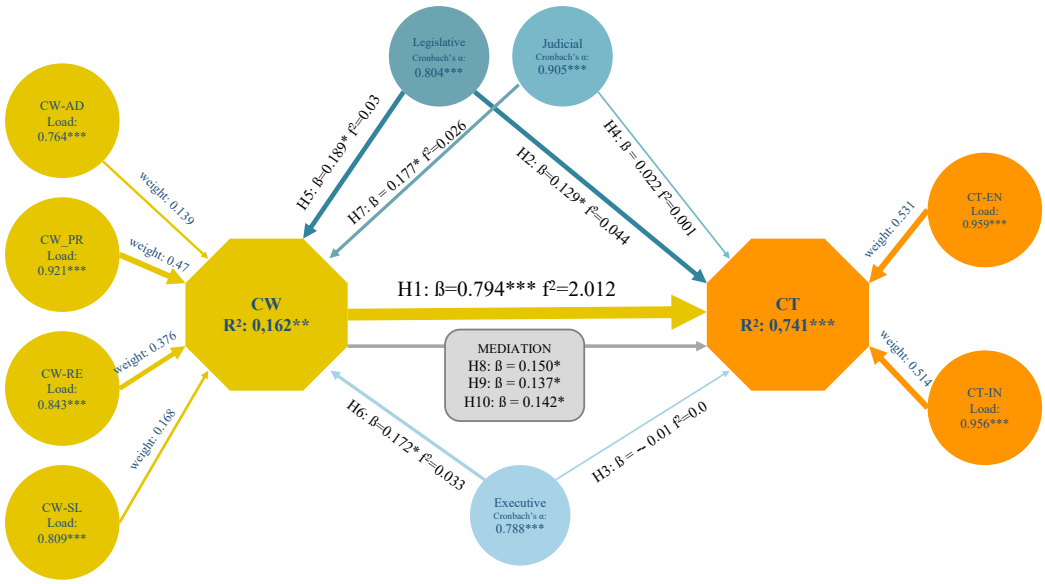

Figure 2: Results of the proposed conceptual model represented graphically.

CONCLUSIONS

This study has added a new perspective of creative thinking, which we believe to be crucial to generate original ideas that will be useful and sustainable (Sala, Punie and Garkov, 2020). Such ideas are supported not only by intention to innovate (Huges et al., 2018) but also by engagement in entrepreneurship when facing the new challenges predicted (Haddad, Haddad and Nagpal, 2021). Given demonstration of the relationships of self-confidence to both improvement of competences and behavior and creative results (Egan et al., 2017; Karwowski and Kaufman, 2017; Karwowski, Lebuda and Wiśniewska, 2018; Karwowski, Lebuda and Beghetto, 2019; (Lebuda, Zielińska and Karwowski, 2021), we evaluated creative self-concept. The construct shows satisfactory predictive performance,

suggesting that it could be used to identify differences in self-perception that encourage creative competence, as predicted in 2030. Recall that prior studies (Kelley and Kelley, 2013; Amabile, 2019) have observed that people who recognize their preferences and feel competent are probably more open to solving real problems that make a positive difference in the world.

From the perspective of Mental Self-Governance Theory (Stermberg, 1999, 1988), on the other hand, our study confirms that different thinking styles are related to creative thinking considered as a construct composed of innovation and entrepreneurship. Legislative thinking style was shown to be a better candidate when adapting creatively to unique situations, like those predicted (McKinsey and Co., 2021; Agrawal et al., 2020). This style's characteristics of greater openness to challenge when facing a problem, interest in proposing new solutions, and exploitation of the resources available, as well as motivation for testing its ideas and ways of doing things fit perfectly with creative competence. This is not the case for judicial thinking styles, and even less so for executive styles, whose relationship to creative thinking was not significant. These results suggest that it would be interesting, when training future leaders, to include knowledge of their thinking styles. Doing so would enable them to understand how their preferences influence their approach to creative behaviors.

One novel aspect of our study focuses on encouraging creative self-perception both in thinking styles related directly to self-perception and in styles for which this relationship has not been previously established (SDGs 4, 8, 10). Considering that creativity and collaborative work will go hand in hand in the coming decade to solve real problems (Dondi et al., 2021; Agrawal et al., 2020 Moneta et al., 2010), efforts to train an authentic, ethical transformational leader (Sternberg, 2021; Hoch et al., 2018) could include collaboration to encourage leaders to identify strongly with the group. Such identification would encourage them to feel responsible for considering both their interests and the interests of others in

their decisions (Sturm, Herz and Antonakis, 2021; Scholl et al., 2018). Our study thus considers the construct collaborative work as a second-order composite constituted of indicators of proactivity, shared leadership, adaptability, and respect. The findings showed that focusing teams' attention on proactive, respectful behavior more than on adaptability and developing teams with shared leadership could help to reduce differences that might lead to conflicts—as Volpentesta, Ammirato, and Sofo argue (2010, 2011, 2009)—enabling teams to focus their attention on more effective creative solutions.

Collaboration contributes growth, sustainability, and inclusion (Sternfels et al., 2021), and future leaders may need to collaborate in identifying and fostering any aspect of creativity (Sternberg, 2008, 2008b; Sternberg, Kaufman and Pretz, 2003; Sternberg and Karami, 2021). The issue is not for everyone to be the same in our creative vision of how to generate new ideas and carry them out, but to understand our differences and find channels that enable us to work together. The results for mediation in the model we present attest to this possibility, as collaborative self-perception enabled establishment of the relationship, we were seeking between the different thinking styles and creative competence.

Implications

First, it can serve to guide both instructors and students who wish to be active participants in identifying their own competences, as well as the resources and support they need to increase their creative confidence. At individual level, having one's own thinking style profile associated with one's perceived competence profile would help people identify how their preferences affect them when processing information and orienting their behavior in developing their competences. In the educational context, this personal knowledge, oriented by instructors to a growth mentality, would facilitate better disposition to engage in

entrepreneurship and to innovate new ideas in any context (formal, informal, or nonformal). At the level of instruction, professors who have this information can better attend their students' individual differences, creating heterogeneous work groups that focus on development of both creative and collaborative competences (Jung et al., 2021). Our study has shown that respect, proactivity, and shared leadership are more efficient in performance of group work if we wish to improve inclusion of differences in thinking in the classroom context. More specifically, we could consider this as a fundamental part of education for students trained in leadership, as it is they who will train and direct tomorrow's teams.

Training for lifelong learning, integration in the world of work and awareness of the 2030 SDGs (Goals 4, 8, 11) requires the strengthening of integrating models. For that purpose, at a later stage of our study, the collected information on thinking styles and competencies was shared individually with each participant. This process, together with the subsequent meetings, sought to focus them on both their competence and their style preferences in order not only to help them identify them but also to maintain or shape them in formal, informal or non-formal contexts.

Limitations and Future Lines of Research

We have considered the different approaches to the construct "creative beliefs" that we find in the scientific literature (Karwowski, Lebuda and Beghetto, 2019). We need to address experience, creative ability and motivation, paying special attention to the learning environment and the messages implicit in it (Gube and Lajoie, 2020). Our next longitudinal study aims to incorporate relevant information on the correlation between the results on creative and collaborative self-concept presented in this study and development of each participant in

specific future activities (Reiter-Palmon et al., 2012) to solve global problems proposed inside and outside the university environment. We realize that following university students once they join the work world is complicated but crucial to understanding the effect of new competence-based models of education.

As to thinking styles, our study has focused on the styles corresponding to the dimension of function. Our goal in this study is not to incorporate full profiles of styles such as those defined by Zhang and Sternberg in subsequent studies (Zhang, Sternberg and Rayner, 2012) developing Mental Self-Governance Theory. For example, it might seem obvious that individuals with external thinking styles prefer to work in contexts where they can interact and collaborate with others. Yet one may interact with others and lack skills (Zhang, 2021b) such as sharing leadership roles or acting respectfully or proactively in one's collaborative efforts. Future studies will enable us to incorporate new distinctions among a full set of thinking styles.

In future research, the model proposed in this study could be extended to human resources management or leadership of innovative and entrepreneurial teams in real contexts. For example, fostering collaborative creativity requires psychological security (Kelley and Kelley, 2013) and knowledge of how different thinking profiles enrich the creative process, it would help each person both to understand differences and to respect them. In other hand, our proposal could foster agile acquisition of new competences in workers who must improve their competences (reskilling) or learn others for a new role (upskilling) without costly training processes (Field, Hancock and Schaninger, 2022). Let´s recall the power of vicarious learning (Bandura, 2001, 2000, 1984) when the model to follow is competent; such learning occurs naturally in a collaborative context. Finally, our model suggests a change of perspective in selection methods, which are currently oriented to choosing workers based on strictly creative profiles. Really,

we can all develop this competence (Glaveanu et al., 2020) if we form heterogeneous teams with a common purpose.

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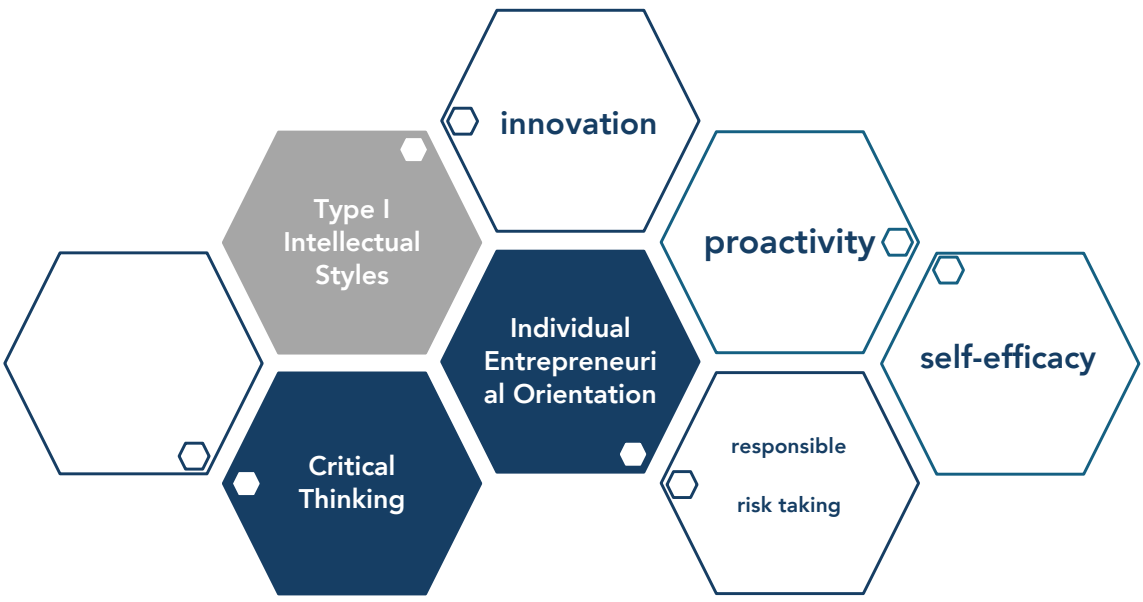
Critical Thinking is a higher cognitive skill for decision making and we foresee strong growth for demand it. In contrast, demand for basic cognitive skills (literacy, numeracy, and data entry) are projected to decline substantially because these skills are highly automatable for AI.

(Lund et al., 2021)

Capítulo 3


innovation
Type I Intellectual Styles
proactivity
Individual Entrepreneuri al Orientation
self-efficacy
Critical Thinking
responsible
risk taking

CAPÍTULO 3 ▷ INFLUENCE OF DISPOSITION TOWARDS CRITICAL THINKING IN INDIVIDUAL ENTREPRENEURIAL ORIENTATION OF CREATIVE INTELLECTUAL STYLES.

ABSTRACT

Given the importance of entrepreneurship in the socioeconomic changes predicted in 2030, the European Union proposes that university students receive transversal training for entrepreneurship. This study aims to analyze individual entrepreneurial orientation in university students to determine how disposition towards critical thinking facilitates this relationship in students with creative and innovative thinking styles. The study was performed with university students of different genders in different years of study and degree programs. The analysis used structural equations modelling with partial least squares (PLS-SEM), a technique recommended for non-parametric complex exploratory studies based on analysis of variance. Thinking Styles associated with creativity and cognitive complexity (type I intellectual styles, Sternberg and Zhang, 2003) showed differences in their direct relationship to individual entrepreneurial orientation, which improved through disposition toward critical thinking. The robustness analysis of the model provides valuable information on the direction of the relationship between disposition toward critical thinking and individual entrepreneurial orientation. From the nonsignificance of the control variables, we deduce that the results are generalizable to a new sample and support the results of recent research about gender differences. According to this, proposed model extends research on Individual Entrepreneurial Orientation in university students

to strengthen orientation to self-employment, promoted in the European vision of lifelong learning for all.

Keywords: Disposition Towards Critical Thinking, Individual Entrepreneurial Orientation, Creative Intellectual Styles, Higher Education, Inclusive Educational Model (SDG-2030).

INTRODUCTION

Entrepreneurship is a crucial transversal goal through which education can respond to the demands of the new, constantly changing job market (OECD, 2021). The results of Sieger et al. (2021) indicate that university students' intention to start a business when they finish their studies are lower (17.8%, increasing to 32.3% five years later) than their intention to work for others (64.9%, varying slightly five years later). Among the multiple factors that could explain this difference, the 2022 GEM Report believes that personal variables such as individuals' belief in themselves—the belief that they have not only the skills and knowledge (self-image) but also the confidence that they can do so (fear of failure)—can influence the decision to start a business. AlHouli and Al-Khayatt (2020) show that university environments tend to focus on academic content without resources for tackling key competences required for the professional future. When business education is oriented to actions, however, it also seems to influence students' perception of business self-efficacy negatively (Bohlayer and Gielnik, 2023). Since the last decade, Williams and Gurtoo (2016) proposed that degree programs must focus on skills and knowledge, as well as on the mentality needed to succeed in a local business context. The question is how to do this by putting the student at the center in a context as uncertain as the current one.

Individual Entrepreneurial Orientation construct (IEO) was first introduced in psychological research's contributions to distinguishing individuals with

entrepreneurial tendencies from more conservative managers (Krauss et al., 2005). From the perspective of IEO, both behavioral and attitudinal variables orient a person to propose self-employment to face challenges in the environment. This internal predisposition of each individual will be essential to accept or face challenges in a team or an organization (Covin et al., 2020). For Frese and Gielnik (2014), characteristics typical of personal initiative (being an entrepreneur, proactive, able to overcome obstacles) are more likely to lead to greater business success. Kraus et al. (2019) propose that people with a high level of IEO are more likely to work on exploratory activities that ground the whole intrapreneurial process, positively affecting their mode of self-regulation. Further, people's inner strength is driven by psychological satisfaction, the source of motivation that enables entrepreneurs to persevere in the face of unending difficulties and challenges (Chakraborty et al., 2020).

Does self-perception have value in this context? Beyond the educational process, students who maintain self-efficacy and passion after their education are more inclined to business creation (Gielnik et al., 2017). Caggiano et al. (2020) argue that students can perceive their personal skills when evaluation is related to activities in which they are involved personally. Canet-Giner et al. (2020) also believe that self-perception is necessary to introduce the perceptions of employees from innovative firms, differentiating between what is predicted, implemented, and perceived. In fact, identifying one's own competences provides a foundation for new, constantly changing job perspectives in which workers will have to adopt an active attitude to seek the resources and support they need to improve these competences (WEF, 2021).

Students may thus be developing varied learning in nonformal and informal as well as formal contexts (ILO, 2021) to encourage: (1) more analytical view of their environment and (2) preferences for certain types of tasks or situations that improve their skills to adapt to an ambiguous future. As to the first point,

literature suggests that critical thinking helps students to develop essential skills for making decisions, evaluating risks, and developing an entrepreneurial idea effectively (Dada, Adegbuyi, and Ogbari, 2023). Such skills increase their confidence and their ability to face the risk of failure with greater security. Critical thinking could thus be considered a fundamental variable for making vital and important decisions, such as starting a business. As to the second point, thinking styles provide an appropriate theoretical framework for identifying which thinking patterns are related to IEO because they are linked to individuals' preferences in using their skills, processing information, and orienting their behavior (Zhang and Sternberg, 2012). The relationship of thinking styles to IEO could provide information on predisposition to perform entrepreneurial activities and to focus on self-regulating one's behavior to achieve these activities.

Given the importance of underlying cognitive pathways that facilitate students' positive orientation to entrepreneurship, our study has several aims: first by evaluating the predictive power of disposition towards critical thinking (DTCT) on Individual Entrepreneurial Orientation (IEO); second, to examine the direct relationships of thinking styles that have shown cognitive complexity in different areas of the scholarly literature; third, to analyze the mediating effect of critical thinking on styles that do not show a direct relationship to IEO; and, finally, to propose educational strategies.

THEORETICAL BACKGROUND AND HYPOTHESES

Individual Entrepreneurial Orientation (IEO)

IEO refers to an individual's internal competences to accept and face challenges in the environment that drive the intention to start a business (Bolton and Lane, 2012). Scientific research has used different dimensions of IEO, such as

orientation to achievement, orientation to learning, personal initiative, and orientation to risk to build this construct (Krauss et al., 2005). Gradually, scholars have added dimensions, such as innovation and proactivity in their relationship to French students' business performance (Fayolle, Gailly and Lassas-Clerc, 2006) and autonomy in their relationship to Indonesian students' intention to start businesses (Kurniawan et al., 2019). Measurement instruments like those in Bolton and Lane (2012) have led to agreement among many of these studies in relating IEO to new constructs that expand new relationships (Hassan et al., 2021). In samples of students as entrepreneurs, however, only risk assumption, innovation, and proactivity have been maintained with satisfactory **α** Cronbach coefficients (Popov et al., 2019).

Considering the paradigm for Lifelong Learning in European educational context, IEO is a variable any student needs to develop to face an uncertain labor context (Sala et al., 2020). In this line, our study adapts to the university context the dimensions of proactivity, innovation, and risk taking/responsibility, including also self-efficacy which has been shown significantly to influence the early stages of launching a business (Anwar and Saleem, 2019; Newman et al., 2019). We thus define and evaluate each dimension of the construct IEO as follows:

- Proactivity, understood as the disposition to actively seek opportunities through continuous learning (Sala et al., 2020) and oriented towards colaborative action because in academic contexts cooperation is more strengthen than competitiveness. This distinction is supported by the results of Krueger (2006), which identified a significant negative correlation to measuring competence vs. cooperation, in which cooperative approaches to achievement benefit the search for opportunities. Therefore, in university context, students are more oriented to proactivity when they contribute their ideas and knowledge to work on team efficacy, exchange information, and share their resources, even when they

mobilize other classmates in the design, development, and evaluation of a work plan.

- Innovation, understood as the orientation to generating novel, original ideas that are useful and sustainable and that any person can develop to generate valuable results through effort and deliberate practice (Sala et al., 2020; Cachia et al., 2010). In the university context, this aspect appears as the predisposition to propose new solutions to problems or situations posed in class, show interest in discovering and understanding other groups' or different fields' work procedures to combine them with (students') knowledge and initiating strategies and/or projects, and even new adaptations.

- Risk taking/Responsibility, understood as the orientation to a significant degree of personal control for adventuring into the unknown (Sala et al., 2020). Although the literature has considered Risk Taking inherent to an opportunity in the context of entrepreneurship (Krueger, Reilly and Carsrud 2006; Bolton and Lane, 2012; Vargas-Halabí, Mora-Esquivel, and Siles, 2017), taking bold measures for adventuring into the unknown can be seen in stressful academic situations that students overcome. For example, when they include actions to maintaining or changing one's perspectives as needed to adapt quickly to unknown learning environments.

- Self-efficacy, understood as the as a motivational aspect that allows individuals to seek out challenges as an opportunity to learn and grow (Sala et al., 2020). The will to undertake autonomous actions that enable change and/or regulate one's responses to make them the results of a conscious reaction (Zimmerman, Bandura and Martínez-Pons, 1992). Bandura (2017) related it to persistence to face difficulties and maintain effort, decreasing the level of emotional activation when facing a challenge. Considering all the above, students show self-efficacy when they are oriented to goals because they trust

their strengths, facing difficult or unfamiliar tasks with security, persistence, and confidence. When they are secure in defending their decisions with arguments and taking failures as learning experiences to improve and learn.

Disposition Towards Critical Thinking (DTCT)

Critical thinking is a higher-order cognitive skill for facing uncertainty, complexity, and change (European Commission, 2020). In the Delphi Report (Facione 1990), 83% of experts in the qualities of a good critical thinker agreed that twelve of these qualities are oriented to one's own life—that is, "reasonable reflexive thinking that focuses on deciding what to believe or do". In that line, critical thinking disposition is closely related to management of learning, because it implies self-directed, skilled analysis of information, beliefs, or knowledge with constant reconstruction of one's own thinking (Ennis, 2015) enabling people to make effective decisions, consider the consequences of their attitudes and actions, and make changes to reestablish trajectories of effective performance (Norris, S. E., 2018). According to Molokhina, Pishchik, and Fomin (2021) Critical Thinking helps entrepreneurs to feel that they are competitive people who can manage any circumstance. As a competence for lifelong learning, it involves an attitude toward life that seeks to manage complex problems properly, exchange perspectives, adopt reasoned positions, and reach conclusions based on evidence (Sala et al., 2020).

Disposition towards Critical Thinking and Individual Entrepreneurial Orientation

DTCT implies an open mentality that leads the person to show a (psychological) tendency toward critical thinking (Sosu, 2013). This disposition implies evaluating

new ideas critically, questioning evidence of prior experience (reflexive skepticism) to change one's opinion in the light of evidence (critical openness) when a problem must be solved or a decision made (Álvarez-Huerta, Muela, and Larrea, 2022). When these skills are not limited to the cognitive (reflection, problem solving, decision-making, argumentation, etc.) also play an important role in people's attitudes, values, and interests (Manassero-Mas, Moreno-Salvo and Vázquez-Alonso, 2022). In students, stimulating critical thinking can foster a business mentality and improve orientation to entrepreneurship in higher education (Norris, 2018; Lampert, 2007), avoiding students' perception of themselves as novices unqualified for school projects or their instructors as parties in the process of starting a business (Günzel-Jensen and Robinson, 2017).

Liñán and Fayolle (2015) indicated that the complexity of the entrepreneurship process stems from its involvement of cognition as well as entrepreneurial activities. In fact, entrepreneurs and aspiring entrepreneurs classified critical and creative thinking skills as the first and second criterion, respectively—as more important for success in business management (Hatthakijphong and Ting, 2019). Analysis of several models of entrepreneurial education (Bandera, Santos and Liguori, 2021; Pretorius, Nieman and Vuuren, 2005) concludes that it is crucial to develop higher capabilities in students so that their mentality and behavior act in an entrepreneurial way. Teaching students that they have creative, practical options based on wisdom can encourage them to tackle problems in ways they would not otherwise have thought of using (Sternberg et al., 2021; Sternberg, 2004). Based on the literature review, we propose that:

H1: Disposition towards Critical Thinking (DTCT) is positively related to Individual Entrepreneurial Orientation (IEO).

Intellectual Styles

Mental self-government theory approaches thinking styles as the preferred way of using the skills we have in our daily activities. These skills can vary depending on the demands of a specific situation (Sternberg, 1988). The theory proposed 13 thinking styles that differ from each other based on: function (type of mental processes in which they participate), form (structure of the tasks in which they tend to be involved), level (concern for detail), area (independence with which they work), and inclination (adherence to established methods). Zhang and Sternberg (2005) proposed an integrative model of constructions of style: the Threefold Model of Intellectual Styles. This model regrouped thinking styles into three factors, two of which were consistently differentiated from each other regarding tendency to become involved in cognitively complex processes. The primary factor, termed Type I, is characterized by high levels of cognitive complexity. It encompasses mainly the liberal style, as the degree to which a person faces tasks in a novel way; the legislative as more oriented to performing tasks that require creative processes; the judicial for its preference in evaluating others' work; the hierarchical for its capability in establishing priorities among multiple tasks; and the global for paying more attention to the general panorama of a problem. The secondary factor, Type II, shows a tendency to be involved in fulfilling norms and thus pragmatic simplicity. The tertiary factor, Type III, shows attributes of Type I or Type II factors based on specific contexts and tasks, preventing formulation of any specific hypothesis about them.

Type I Intellectual Styles in relation to IEO

The scholarly literature associated with entrepreneurial education places greater emphasis on traits of creativity and cognitive complexity than on traits that conform to norms and are cognitively simple (Zhang, 2015). It is because Type I

styles are more adaptive, flexible, and self-efficacious in university students' decisions in their degree program (Fan, 2016) than are Type II intellectual styles, which have been related to anxiety, neuroticism, and lack of openness to change (Zhang, 2021). One example in real organizational contexts is that managers prefer styles that generate complex cognitive processes to cognitively simple processes that involve fulfilling norms (Minbashian, Birney, and Bowman, 2019). If we relate this reasoning to learning, individuals who adopt an in-depth approach expect to obtain true understanding of what they learn, whereas individuals who adopt a superficial approach seek to reproduce what they are taught to fulfill the minimum requirements (Zhang, Sternberg and Rayner, 2012). Follow rules are very different from what it is involved in starting a business to provide new and innovative solutions to real problems.

On the other hand, Fan (2016) confirmed that thinking styles play an important role in university students' self-efficacy for taking professional decisions. Students with preferences for the type I intellectual style showed more confidence than their classmates in gathering job information, self-evaluating precisely, choosing professional goals, planning professional development, and solving possible professional problems. Studies that relate Type II styles, in contrast, showed a negative relationship to indicators of strength, psychosocial development, and mental health (Zhang, 2021). Since Type I thinking styles (legislative, judicial, hierarchical, liberal and global) are related to creativity, greater cognitive complexity, evaluation of the utility of information, persistence in individual tasks, and consideration of one's ideas in a broader context, our study focuses on these styles to explore their relationship to IEO. According to differences between each of these styles (Amato et al., 2018; Zhang and Sternberg, 2009; Stenberg, 1997), we hypothesize that:

H2: The legislative, judicial, hierarchical, liberal, and global thinking styles, which the literature has classified as Type I intellectual styles, can show differences in their direct relationship to IEO.

It is possible that legislative, liberal, and global styles (H2a, H2d, and H2e, respectively) show a direct and positive relationship to IEO. The literature has identified legislative style as a sign of business cognition, liberal style as disposition to change, and global style was correlated to the classical view of entrepreneurial intuition. Judicial and hierarchical style may, on the other hand, be negatively related to IEO (H2b, H2c), since judicial styles prefer to analyze existing ideas and hierarchical style to face problems with a systematic approach that plans goals based on their importance. In conclusion, we hypothesize:

- H2.a: The Legislative Thinking Style is positively related to IEO
- H2.b: The Judicial Thinking Style is negatively related to IEO
- H2.c: The Hierarchical Thinking Style is negatively related to IEO
- H2.d: The Liberal Thinking Style is positively related to IEO
- H2.e: The Global Thinking Style is positively related to IEO

Type I Intellectual Styles in relation to IEO through DTCT.

In relation to Sternberg's theory of mental self-government and Critical Thinking Disposition, Zhang (2003) showed the significant prediction of the legislative, judicial, hierarchical thinking styles for inquisitiveness disposition. She indicated that, to be inquisitive, an individual needs to prioritize (hierarchical style) and decide what information he or she needs. After deciding the particular information one wants, the individual needs to analyze (judicial style) and understand the information. Given these styles' capability to face complex learning (Zhang and Sternberg, 2012), it is possible that the relationship of judicial

and hierarchical styles to IEO improves through DTCT. In conclusion, we hypothesize:

- H3.a: The Judicial Thinking Style improve the relation to IEO through DTCT
- H3.b: The Hierarchical Thinking Style improve the relation to IEO through DTCT

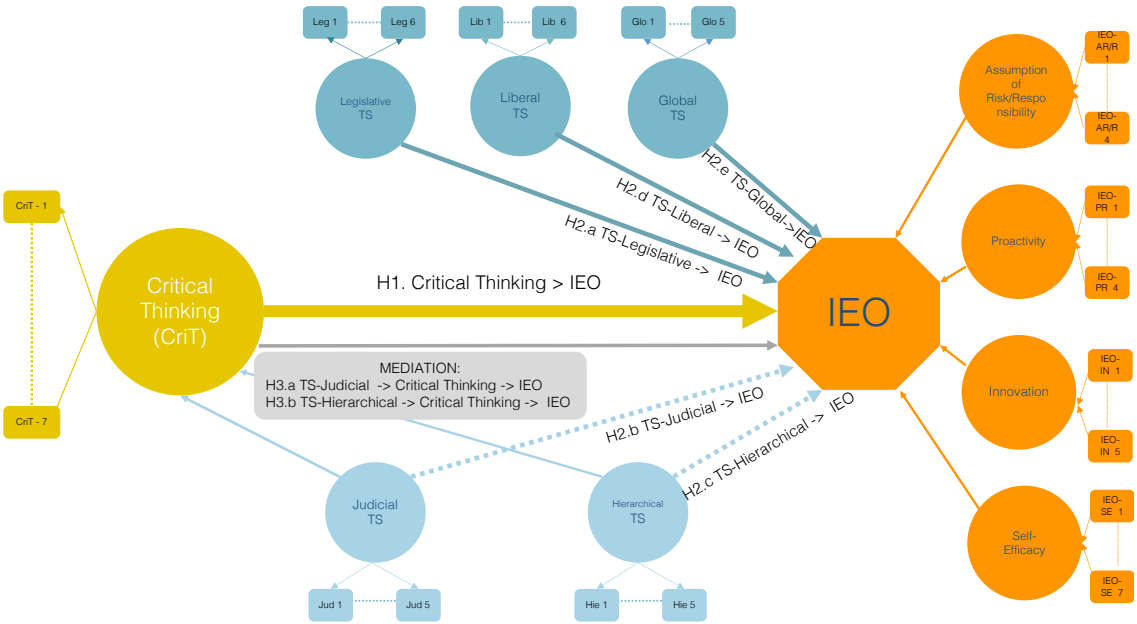


Figure 1. Proposed conceptual model.

METHODOLOGY

Sample and Procedure

The study was performed in 2020 with university students ages 18-49 (64% women, 36% men) enrolled in the Faculty of Economics and Business of a Spanish public university. The students were sent an email with general information on the study, anonymity, confidentiality of their responses, and voluntary character

of their participation. The surveys were distributed and the responses collected through online links sent at two different times with separate instructions to avoid response fatigue. To avoid common method bias, neither the instructions nor the questionnaire presented to the students enabled them to identify the study variables (Podsakoff et al., 2003). Further, the questionnaires were designed to mix the questions to avoid respondents relating them to the various study hypotheses. The quality of the 500 responses received was guaranteed by eliminating incomplete questionnaires. We ultimately analyzed a sample of 208 students (see Table 1).

Table 1. Characteristics of the sample.

Respondent Demographi	208	%		208	%
Gender			**Degree**		
Female	133	64%	GADE	77	37.02%
Male	75	36%	GMIM	35	16.83%
Age			GECO	25	12%
18 -20	84	40.38%	GTUR	17	8.17%
21-22	70	33.65%	GFICO	13	6.25%
23- 49	54	25.96%	GADE-Law	21	10.10%
Year in program			GADE-Enginee	20	9.61%
1	44	21.15%			
2	33	15.87%			
3	57	27.40%			
4	62	29.81%			
5	12	5.77%			

Source: Own elaboration using Excel. GADE: Degree in Business Administration and Management; GMIM: Degree in Marketing and Market Research: GECO: Degree in Economics; GTUR: Degree in Tourism; GFICO: Degree in Finance and Accounting; GADE-Law: Double Degree in Business Administration and Management and Law; GADE-Engineering: Double Degree in Business Administration and Management and Engineering.

Analytic Strategy

We used PLS-SEM technique to analyze the date with Smart-PLS software version 4.0.9. We first evaluated the reliability and validity of the measurement model and then examined the structural model and hypothesized relationships. Finally, we analyzed the mediating effects. Since our study is based on a model that includes second-level composite constructs (IEO) as well as mediations, PSL-SEM is the most suitable method of analysis (Hair et al. 2019b). Both the structural model's estimated goodness of fit (0.053) and the robustness analysis (Appendix 2) suggest that our proposal provides the best explanation of the data.

RESULTS

Measurement model

First, to construct the dependent variable, we evaluated as reflexive each dimension that would compose the second-order construct IEO. The literature considers these dimensions as theoretical concepts that are not directly observable and that are linked to people's behaviors, attitudes, and perceptions (Hair et al., 2019; Henseler, 2017). Reliability or internal consistency (see Appendix 1) was guaranteed based on values for the **α** Cronbach and composite reliability above the recommended threshold of 0.7 (Cohen, 1992; Hair et al., 2019). Convergent validity at construct level was confirmed through an individual reliability of each indicator with levels of statistical significance above 0.7 in all loadings and an average variance extracted (AVE) above the threshold of 0.5 (Gefen, Straub, and Boudreau, 2000). To evaluate the discriminant validity of each indicator, the literature recommends using the heterotrait-monotrait (HTMT) matrix, since it is more sensitive in PLS-SEM analysis (Hair et al 2019b). Table 2.2 in Appendix I shows that the results took values below 0.90 and significantly

different from 1. In conclusion, discriminant validity was guaranteed in each variable analyzed.

Table 2. Measurement model.

1. First-order reflective variables							
Constructs / Items	Individual reliability	STDEV	t-values (|O/STDEV|)	Cronbach's α	Rho_A	Composite Reliability	AVE
1.1. Reliability and convergent validity							
Critical Thinking (CriT)				0,907	0,909	0,926	0,643
CriT-1. To reflect on a situation, I first systematically observe .	0,731	0,041	17,649				
CriT-2. I analyze the causes of a problem, collecting information that allows me to understand it.	0,875	0,019	46,936				
CriT-3. I select relevant elements for the objective understanding of a problem.	0,846	0,025	34,064				
CriT-4. I analyze and contrast information before solving a problem.	0,818	0,032	25,559				
CriT-5. Solutions to a problem must include the process to put them into practice.	0,796	0,037	21,755				
CriT-6. I analyze the results of the solutions I propose.	0,757	0,054	13,896				
CriT-7. I analyze the scope and consequences of my proposals.	0,782	0,034	23,023				
Thinking Styles TYPE I							
TS-Legislative				0,782	0,791	0,851	0,533
TS-Leg 1. When I make decisions, I tend to rely on my own ideas and ways of doing things.	0,689	0,05	13,662				
TS-Leg 2. When I face a problem, I use my own ideas and strategies to solve it.	0,744	0,047	15,871				
TS-Leg 3. I like to play with my ideas and see how far they go.	0,789	0,034	22,913				
TS-Leg 4. I like problems that allow me to test my own way of solving them.	0,701	0,053	13,345				
TS-Leg 5. I like situations where I can use my own ideas and ways of doing things.	0,723	0,051	14,236				
TS-Judicial				0,905	0,906	0,93	0,726
TS-Jud 1. I like to test and evaluate opposing ideas or points of view.	0,849	0,027	31,815				
TS-Jud 2. I like projects where I can study and evaluate different ideas and points of view.	0,852	0,024	36,023				
TS-Jud 3. When making a decision, I like to compare opposing points of view.	0,875	0,02	43,028				
TS-Jud 4. I like situations where I can compare and evaluate different ways of doing things.	0,899	0,018	48,722				
TS-Jud 5. I enjoy jobs that involve analyzing, evaluating and comparing things.	0,783	0,036	21,788				
TS-Hierarchical				0,835	0,845	0,889	0,668
TS-Hier 1. When I encounter difficulties, I know how to distinguish their importance and the order in which I should ad	0,817	0,037	22,268				
TS-Hier 2. When there are many things to do, I know how to clearly distinguish in which order I should do them.	0,81	0,034	24,082				
TS-Hier 3. When I work on a task I can see how each part relates to the overall goal.	0,85	0,021	40,452				
TS-Hier 4. When expressing or writing ideas, I highlight the main idea and how all the aspects fit together.	0,79	0,036	21,693				
TS_Liberal				0,884	0,914	0,911	0,633
TS-Lib 1. I like to change my routine to improve the way I work.	0,704	0,053	13,168				
TS-Lib 2. I like to question old ideas or ways of doing things and look for better ideas or methods.	0,865	0,019	45,975				
TS-Lib 3. When faced with a problem, I prefer to try new strategies or methods to solve it.	0,828	0,03	27,178				
TS-Lib 4. I like projects that allow me to approach a situation from a new perspective.	0,842	0,033	25,206				
TS-Lib 5. I like to find old problems and find new methods to solve them.	0,809	0,034	23,964				
TS-Lib 6. I like to do things with new methods, not used by anyone before.	0,709	0,051	13,869				
TS-Global				0,906	0,91	0,93	0,727
TS-Glo 1. I like situations or tasks in which I don't have to worry about details.	0,867	0,037	23,152				
TS-Glo 2. When I have to carry out a task, I focus more on the overall effect than on the details.	0,852	0,043	19,962				
TS-Glo 3. I like situations where I can focus more on the big picture rather than the details.	0,856	0,046	18,796				
TS-Glo 4. I tend to pay little attention to details.	0,827	0,049	16,99				
TS-Glo 5. I like to work on projects that deal with general issues and not details.	0,86	0,046	18,735				

Notes: One-tailed test *p<0.05 **p<0.01 ***p<0.001

1.2. Discriminating Validity Assessment First-order reflective variables						
HTMT						
	TS-Legislative	TS-Judicial	TS-Hierarchical	TS-Liberal	TS-Global	Critical Thinking
TS-Legislative						
TS-Judicial	0,624					
TS-Hierarchical	0,642	0,548				
TS-Liberal	0,645	0,561	0,472			
TS-Global	0,122	0,061	0,08	0,114		
Critical Thinking	0,376	0,392	0,476	0,321	0,105	

2. Second-order formative variables								
Multicollinearity (VIF) // Evaluation of weights of formative variables < 1/√(n)								
Items	Weight	STDEV	t-values (|O/STDEV|)	VIF	Relative contribution	Loading	STDEV	t-values (|O/STDEV|)
Individual Entrepreneurial Orientation (IEO)								
Assumption of Risk/Responsibility (AR/R)	0,078	0,06	1,309	2,502		0,802***	0,042	19,154
Self-efficacy (SE)	0,348***	0,078	4,435	3,328		0,927***	0,021	43,996
Innovation (IN)	0,452***	0,078	5,82	3,071	weights<0,5	0,931***	0,021	44,98
Proactivity (PR)	0,23**	0,073	3,15	2,339		0,842***	0,037	22,771
Notes: One-tailed test *p<0.05 **p<0.01 ***p<0.001								

Second, we evaluated the measurement model with first- (1) and second-order (2) variables: (1) DTCT, as first-order reflexive variable, fulfilled all criteria for internal consistency and for convergent and discriminant validity through the heterotrait-monotrait matrix (Hair et al., 2019; Henseler, 2017). The same occurred with each Type I thinking style evaluated. Table 2 presents the results. The construct IEO was analyzed as a second-order formative variable (Diamantopoulos et al., 2008).

As Section 2 of Table 2 shows, each dimension of IEO confirmed the absence of multicollinearity through the variance inflation factor (VIF≤3.3) and highly significant factor loadings above 0.7. Further, the magnitude of the weights was relevant in each indicator of the construct ($1/\sqrt{n} < 0.5$).

Structural Model

Analysis of the structural model was performed through bootstrapping, with 10,000 subsamples. The Standardized Root Mean Square Residual (SRMR) showed good fit for both the saturated (0.049) and the estimated model (0.053), enabling validation and explanation of the data analyzed (Benitez et al., 2020). Moreover, when we work with variables on attitudes, perceptions, or behavioral preferences, prediction values of R^2 greater than or equal to 0.2 are considered

high (Hair et al., 2019). Table 3 shows that this criterion is fulfilled for both IEO (R^2=0.754) and DTCT (R^2=0.208).

Table 3. Coefficient of Determination.

R2	Original sample (O)	Sample mean (M)	Std. deviation (STDEV)	t-statistics (|O/STDEV|)	p-values	5.0%	95.0%
IEO	0,754	0,771	0,031	23,967	0	0,717	0,821
Critical Thinking (CriT)	0,208	0,221	0,051	4,08	0	0,14	0,308

The results of the structural model in Table 4 indicate the absence of collinearity among the constructs, with VIF values well below 3, confirming the absence of bias (Hair et al., 2019). The significance and relevance of the direct relationship between DTCT and IEO with a strong f^2 effect (ß=0.754, f^2=1.788) supported H1 in our study. The relationship between Type I styles and IEO was direct and positive for legislative (ß=0.164, f^2=0.061) and liberal styles (ß=0.091, f^2=0.02) but negative for global style (ß=-0.192, f^2=0.13). Following Cohen (1988), effect size is considered small when $0.02 \leq f^2 < 0.15$; moderate when $0.15 \leq f^2 < 0.35$; and large when $f^2 \geq 0.35$. Our study findings confirmed H2.a. and H2.d., although with small effects for legislative and liberal styles. Similarly, we confirmed the direct and significant relationship between global style and IEO, although its negative relationship was not predicted in the prior hypothesis. The judicial and hierarchical thinking styles initially showed a nonsignificant relationship to IEO, which changed in the presence of DTCT (Table V), confirming H3.a (ß=0.154) and H3.b (ß=0.243). The control variables year, degree program, and gender were not significant, enabling us to generalize from the results.

Table 4. Structural Model Results.

Hypothesis Testing	VIF	β	STDEV	t-values (|O/STDEV|)	Confident Intervals		f^2
					5.0%	95.0%	
H1. Critical Thinking > IEO	1,295	0,754***	0,038	19,811	0,688	0,813	1,788***
H2.a TS-Legislative -> IEO	1,744	0,164**	0,052	3,134	0,081	0,253	0,061
H2.b TS-Judicial -> IEO	1,651	-0,008	0,049	0,159	-0,086	0,073	0
H2.c TS-Hierarchical -> IEO	1,588	-0,036	0,049	0,736	-0,119	0,041	0,003
H2.d TS-Liberal -> IEO	1,682	0,091*	0,054	1,688	0,001	0,178	0,02
H2.e TS-Global-> IEO	1,038	-0,192***	0,043	4,415	-0,263	-0,121	0,13
H3.a TS-Judicial -> Critical Thinking -> IEO		0,154**	0,055	2,786	0,063	0,246	
H3.b TS-Hierarchical -> Critical Thinking -> IEO		0,243***	0,055	4,406	0,156	0,335	
Control's Variables							
course -> IEO	1,1	-0,026	0,039	0,674	-0,09	0,038	0,003
degree -> IEO	1,146	0,005	0,039	0,122	-0,057	0,071	0
gender -> IEO	1,212	-0,094	0,078	1,202	-0,218	0,038	0,007

Notes: One-tailed test *p<0.05 **p<0.01 ***p<0.001

Overvall Fit

SRMR	Original sample (O)	Sample mean (M)	95%	99%
Saturated Model	0,049	0,043	0,049	0,052
Estimated Model	0,053	0,047	0,055	0,06

Mediation Analysis

Table 5 presents the results for analysis of the mediating effect through bootstrapping, with 10,000 subsamples. The relationship of judicial (ß=0.223, p=000, f^2=0.098) and hierarchical thinking styles to IEO improved with the indirect effect of DTCT (ß=0.223, p=0.00, f^2=0.098), confirming H3a and H3b. The results of analysis of the Variance Accounted Factor (VAF) showed over 80% full mediation (Hair et al., 2019), enabling us to affirm the mediating effect of DTCT in Type I styles not previously related to IEO.

Table 5. Mediation Analysis.

Hypothesis Testing	β	t-values (|O/STDEV|)	Confident Intervals (5% - 95%)		VAF	Conclusion
Direct Effect						
TS-Judicial -> IEO	-0,008	0,159	(-0,086	0,073)		
TS-Hierarchical -> IEO	-0,036	0,736	(-0,119	0,041)		
Indirect Effect						
TS-Judicial -> Critical Thinking -> IEO	0,154**	2,786	(0,063	0,246)	108%	Full Mediation
TS-Hierarchical -> Critical Thinking -> IEO	0,243***	4,406	(0,156	0,335)	122%	Full Mediation
TOTAL EFFECT						
TS-Judicial -> IEO	0,143*	2,011	0,025	0,261		
TS-Hierarchical -> IEO	0,199**	2,733	0,691	0,813		

Notes: One-tailed test *p<0.05 **p<0.01 ***p<0.001

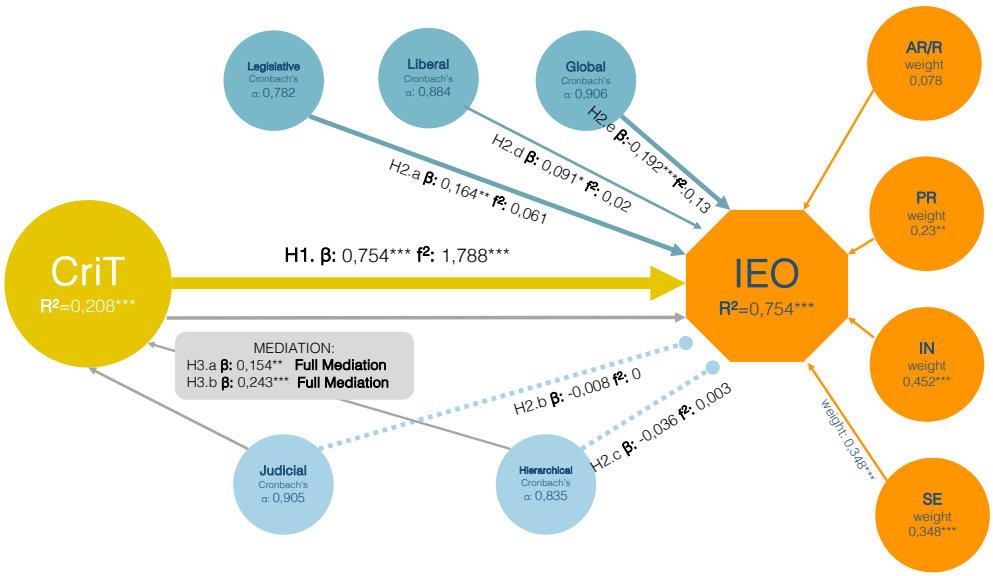


Figure 2: Results of the proposed conceptual model represented graphically.

CONCLUSIONS

The main goal of this study was achieved, due to the findings relating the value of DTCT to IEO. The amount of variance in the dependent constructs explained

by the associated antecedent constructs was high (Hair et al., 2019). The results for the dimensions of IEO, innovation, and self-efficacy showed greater weight on the construct IEO than on proactivity. The dimension of risk taking/responsibility did not show this effect in our sample, even though the loading was significant. This finding makes sense for several reasons: 1) Regarding innovation, university students feel more motivated to discover and understand work procedures for their usual group work tasks independently of the field in which they are working. Proposing new solutions to problems or situations forms part of active methodologies that are strengthened in classroom contexts, as are combining students' knowledge, and exploiting the resources available to propose strategies and/or projects. 2) As to self-efficacy, students who reach the university have a long-term goal and may know from their prior history in secondary school that they can achieve their goals with effort and time. The current methodological proposals guide them more toward understanding that obstacles and failures are opportunities to learn and that confidence in their strengths will enable them to overcome such setbacks. Consolidating these perceptions may enable them to make decisions with greater security and confidence in the future. 3) Because we evaluated proactivity by considering collaboration with class teams, students may have perceived greater resistance to tasks such as contributing ideas or exchanging knowledge to contribute to the team's efficacy. Although university instructors are very aware of the need to encourage their students to exchange information and resources in work group proposals, students do not always put this awareness into practice, seeing these aspects as competitive rather than collaborative. The openness of instructors to co-evaluating the development and results obtained in work groups may be one way to mold such behavior and thus improve proactivity. 4) Finally, as to risk taking/responsibility, university classrooms, as well as other contexts in society, show that it is usually difficult to strengthen taking control of one's behavior in

risk situations such as stress or criticism from peers by searching for strategies to enable people to risk being undervalued or rejected. The strength needed to maintain or change one's point of view through reflection or rational response may be work that depends on the global context in which all students are immersed, whether or not they are in the university.

DTCT strengthens all of the above. Students who analyze the causes of a problem have already been observing the elements relevant to composing and gathering information that enables them to understand these causes. Such students find it easier to face personal challenges and even the entrepreneurial challenges that arise. Analyzing and contrasting information are essential characteristics of thinkers who seek pragmatic solutions and evaluate both the scope of the results and their consequences once they are put into practice. We confirm that DTCT has a significant effect that must be considered in entrepreneurial training strategies. Although self-evaluation of DTCT may seem one limitation of our study, it is important that it is included in measurements of critical thinking because it is oriented not only to curriculum designers but also to the very persons learning at any level and in any educational context to combat real life problems (Whitten and Brahmasrene, 2011). As the Foundation for Critical Thinking indicates, students should be taught to be aware of how they are perceived, so that they may deliberately achieve transfer of evaluation, judging, or deciding to real life opportunities (Adeela, Dias and Botelhoa, 2023).

The second goal of our study produced novel information on how Type I intellectual styles—which prefer tasks that require information processing using more complex thinking with a low degree of structure and that permit originality and high degrees of autonomy to do things in one's own way (Zhang, 2015)—showed differences amongst themselves relative to each component of IEO. In line with the theory and taking into account the results of our study, students who prefer a (1) legislative style are more independent in their thinking and tend to

find ways to enjoy greater freedom from external influences. These preferences make them perceive themselves as more effective in achieving their goals, leading them to propose long-term goals that can be achieved with effort and time. They learn from their failures, facing difficult or unknown tasks with security and confidence. Their predisposition to proposing new solutions to problems or situations is strengthened by their pleasure in testing their ideas and seeing how far they can get. Motivated by discovering and understanding the work procedures of other groups or different fields, they exploit the resources available to them to propose strategies and/or projects. They show themselves to be proactive in these individual tasks but be less so when they must provide ideas to contribute to the team's efficacy or mobilize other people in design and development of an action plan. Nor they prefer risk taking (risk taking: ß=0.085, p=0.115), as do students who prefer (2) liberal style—that is, who tend to be braver in testing new ideas and adapting quickly to unknown and stressful learning environments. Those who showed a predisposition to a liberal thinking style also did so through innovation, since such people like to question the way of doing things and seek better ideas or methods. Students with judicial and hierarchical thinking styles did not show a significant relationship with innovation, proactivity, and self-efficacy, and nor do hierarchical style showed direct relationships in their preferences for risk taking. Students who prefer to work on tasks that enable evaluation, as in the case of the (3) judicial style, are, however, more reflective and open-minded. They are thus more likely to take advantage of new opportunities and seek novelties. As the findings of Kuan and Zhang (2022) suggest, students who prefer to work on tasks that tackle the general panorama of a problem are more likely to take risks, as our study confirms.

The direct relationship of judicial and hierarchical thinking styles to DTCT is more significant. Through this relationship, both styles show a positive and significant relationship to IEO not previously demonstrated. As to the unexpected results

for the global style-IEO relationship, it is likely that an individual orientation (IEO) will be incompatible with such people's natural tendency to pay more attention to the general panorama of a problem (Zhang, 2015). Preferring to concentrate more on the general effect than on the detail of tasks may affect such style's proactivity, and even orientation to innovation, as they pay little attention to details.

Finally, we stress the nonsignificance of the control variables related to IEO: gender, degree program, and year. This finding is not only important for generalization of the results. As other studies more update, our results showed the absence of differences between genders, and it could be indicating progress in educational strategies aligned with SDG-5 (UN, 2015). On other hand, the absence of differences in degree program could open new lines of research about European´s proposes that university students receive transversal training for entrepreneurship (SDG-4 and 8).

Implications

This study makes three important contributions to the existing literature. First, it demonstrates a significant effect of DTCT on IEO in university students with preferences for creative styles of cognitive complexity. Although with the reservations of an exploratory study, this relationship could certainly be kept in mind in the academic contexts that train students in entrepreneurship. According to Krueger (2006), identifying the components of a personal business orientation must enable us to influence desirable directions through education and organizational interventions. Measuring IEO and DTCT in educational contexts could thus guide instructors in evaluating their entrepreneurial goals. A second contribution involves Type I intellectual styles, which are related in very different ways to IEO. These results must be taken seriously in educational entities focused

on the need for their students to be creative innovators. As important is creativity as critical thinking to facilitate conscious, coherent entrepreneurship. As Baron (1998) indicated, the goal is not to produce wholly rational businesspeople, but considering the cognitive perspective would certainly help instructors to improve efforts in their teaching plans and evaluations to increase the possibilities that future business people prosper. Such an approach Sternberg and Zhang (2009) believe will also encourage students to look for classroom environments which enable them to get the most out of their own styles, strengths, and interests. Third, the mediating effect of orientation to critical thinking in the styles that do not show a direct relationship to IEO contributes value to the study of individual entrepreneurship.

Limitations and Future Lines of Research

First, although our study's methodological analyses indicate reliability of the results, we used self-report measures that cannot be correlated with specific behaviors. The conclusions must therefore be interpreted with caution. Second, our study focused on Type I intellectual styles. Additional thinking styles could be incorporated to provide a larger picture. Third, as our proposed model may be conditioned by its specific national and local context, it must be replicated in different countries or regions.

We deduce new lines of research from this result, considering the mediation with other Type II and III styles. As Whitten and Brahmasrene (2011) argue, given the difficulty of teaching critical thinking in the classroom, an interesting initial approach could demonstrate to students how and why to use critical thinking transversally, even in work groups, to improve the effectiveness of their results. Finally, researchers could apply the current model and perform a comparative

study to observe the similarities and differences in different countries and educational context.

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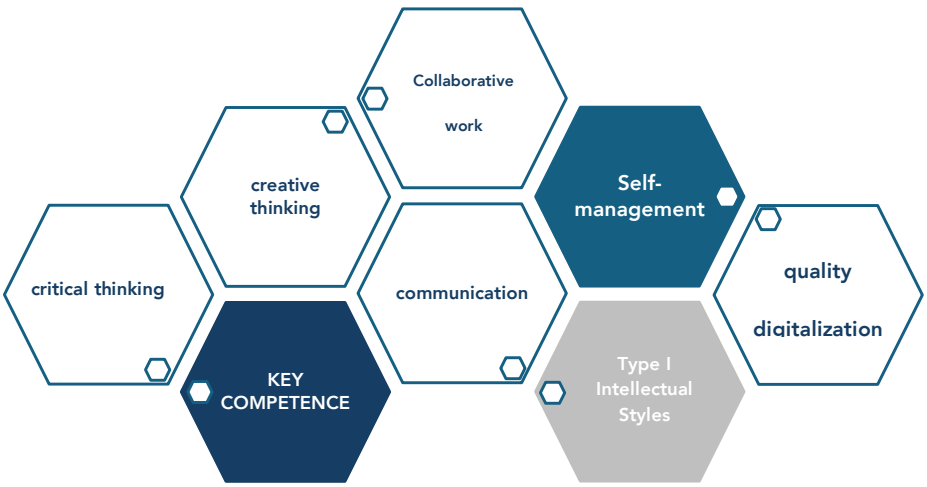
Citizens with higher levels of education are better prepared for future changes in the workplace. However, a higher level of education is not associated with higher proficiency for operating in a digital environment.

(Dondi et al., 2021)

Capítulo 4


Collaborative work
creative thinking
Self-management
critical thinking
communication
quality
digitalization
KEY COMPETENCE
Type I Intellectual Styles

CAPÍTULO 4 ▷ QUALITY DIGITALIZATION. THE IMPACT OF SELF-MANAGEMENT, KEY COMPETENCIES, AND INTELLECTUAL STYLES.

ABSTRACT

European higher education strategies increasingly emphasize pedagogical approaches that integrate the acquisition of digital skills through interdisciplinary and lifelong learning. University students are expected to be creators and critical thinkers in digital contexts. To contribute to this goal, this study investigates how individual factors - such as self-management, key competences, and Type I intellectual styles - predispose to quality digitalization. Using Partial Least Squares Structural Equation Modelling (PLS-SEM), the results demonstrate that key competencies not only predict a predisposition to quality digitalization but also play a mediating role in intellectual styles associated with creativity and complex autonomous learning in the literature. Although these relationships were not improved by self-management, they allowed us to confirm the interdependence with key competences, which showed a statistically significant and high impact relationship in self-management. On the other hand, the proposed model provides new information on the analysis of Type I Intellectual Styles (Mental Self-Management Theory) and the components of self-management in a university environment. The conclusions highlight the importance of personalized educational strategies that allow students to effectively orient these individual variables towards the digital challenges of the world of work.

Key words: Digitalization, Key Competences, Self-management, Thinking Styles, Higher Education.

INTRODUCTION

Business students preparing for the 2030 labor market will need to acquire a wide range of digital skills, embracing interdisciplinary learning and engaging in lifelong learning (Sala et al, 2020). To facilitate this, educational institutions need to evolve and meet these needs with strategies that also require continuous adaptation by teachers and administrators (Díaz-García et al., 2022). Indeed, if students require individualized pedagogical strategies and the feasibility of these strategies is now enhanced through the use of technology, the education system would improve its ability to retain students in higher education (González-González et al., 2023). This was demonstrated in the study by Liu, Zhang, and Liu (2024), where the use of virtual reality technology engendered high levels of satisfaction and motivation to learn in their participants. Delving into how to do this, Roddy et al. (2017) compiled interesting suggestions on the support that online teachers and learners need, highlighting that effective communication, learning strategies and feedback increase in intensive online training. In this direction, Bygstad et al. (2022) recommend adopting, at institutional level, a learning-centered approach to digital transformation (integrating technologies, pedagogies and organizational measures). At the teacher level, redefining digital resources and at the student level, improving their own ability to work in complex hybrid environments. According to Øvrelid et al. (2023), implementing this digital innovation in higher education can take place in three phases: 1Initial digitalization, 2Convergence of Education and Digital Subjects, 3 Institutionalization in a digital space with long-term changes.

To some extent, these proposals are aligned with the Digital Competences for Citizens (DigComp) Framework which emphasizes the application of digital technologies that enhance learning, working and social participation. They suggest five key dimensions of digitalization: Information and data literacy to

manage information taking into account the relevance of the source and its content; Communication and collaboration to interact through digital technologies, appropriately managing digital presence, identity and reputation; Digital content creation to enhance and integrate knowledge; Security to protect privacy in digital environments; Problem solving to identify, solve and manage digital environments that require innovation through technology. This framework aims to guide educational programs and citizens both to use digital technologies responsibly and effectively, and to facilitate their integration into all facets of life. In relation to higher education, DigComp underlines the key role of digital skills in facilitating the immersion of university students in work environments as it will enable them to be better prepared to face complex challenges and integrate smoothly into digitally driven environments (Vuorikari Kluzer and Punie, 2022). By encouraging educational institutions to integrate these skills into their curricula, Europe aims to ensure that students are not only consumers of digital content but also creators and critical thinkers in digital contexts. To contribute to this, the aim of this research is to understand which individual variables would favour quality digitalization and how they could be incentivized in the university context for quality education aligned with immersion in the world of work (SDG-4 and 8).

THEORICAL BACKGROUND AND HYPOTHESIS

Quality Digitalization (QD-Quality Digitalization)

From a lifelong learning perspective, the critical nature of digital literacy lies in the need for individuals to possess a broad range of skills that enable them to navigate and succeed in digitally rich environments (Sala et al., 2020). In the context of inclusive education, Weber et al. (2022) suggest that digital competence not only stands out for its effectiveness in managing digital environments but also because it ensures that learners can effectively and safely

participate in digital learning spaces. Both proposals could be included in the DigCom update (Vuorikari et al., 2022) which details the levels of deepening in the acquisition of digital competence. Adapting them to the university context, we define "Quality Digitalization (QD)" as the individual's readiness to use digital tools and resources, both to access quality information and to enhance learning through active and collaborative participation based on digital content. Table 1 shows examples of the items used for measurement and the relationship of each item to the European approach:

Table 1. Items assessed in relation to the dimensions and levels proposed in DigiCom

Digital Skills Assessed on the Key-Skills 2030 scale		DigiCom Criteria		
Item ID	Item Description	Dimension	Competence (Dimension 2)	Level (Dimension 3)
qd-1	I update information, using multiple digital sources.	1. Information and Data Literacy	Browsing, searching and filtering of data, information and digital content	Base Level1: Identifies information needs and finds data through simple search
qd-2	I participate in teams in digital environments, respecting the rules of collaboration.	2. Communication and Collaboration	Collaboration through digital technologies	Base Level 2: Chooses digital tools for collaborative processes
qd-3	I use computer programmes to organise information.	1. Information and Data Literacy	Data, information and digital content management	Intermediate Level 3: Organises, stores and retrieves data routinely
qd-4	I use digital tools for easy programming.	3. Digital Content Creation	Creative use of digital technology	Intermediate Level 4: Differentiates digital tools to create knowledge and innovate
qd-5	I go deeper into concepts, looking for scientific information.	1. Information and Data Literacy	Browsing, searching and filtering of data, information and digital content	Intermediate Level 3: Performs defined searches and explains access
qd-6	I look for the key elements of a problem after updating information.	5. Problem Solving	Identification of technological needs and responses	Intermediate Level 3: Indicates well-defined needs and selects digital tools
qd-7	I contrast the quality and validity of the information I obtain on a topic.	1. Information and Data Literacy	Browsing, searching and filtering of data, information and digital content	Intermediate Level 4: Organises personal search strategies
qd-8	I relate information, using scientific databases.	1. Information and Data Literacy	Browsing, searching and filtering of data, information and digital content	Intermediate Level 4: Illustrates information needs and organises searches

Self-Management (SM) and Quality Digitalization

A holistic perspective on self-management helps students understand how their emotions, thoughts, and values influence their behavior, in order to regulate them in a sustained and constructive effort throughout life (Sala et al., 2020). Although the literature has approached self-management differently depending on the object of study (e.g. Peterson et al., 2021 on education; Hirschi and Koen, 2021 on professional self-management; Konstantinou and Miller, 2021 on the

skills gap between the workplace and the classroom; Frazier, Schwartz and Metcalfe, 2021 on a model for goal attainment), the common link is the involvement of self-regulatory cognitive processes to direct thoughts, emotions and behaviors towards the achievement of personal and professional goals. With this in mind, our study considers self-management to encompass:(1) the setting and pursuit of immediate and long-term goals (goal setting),(2) the ability to self-regulate behavior (self-regulation) and (3)the belief in one's own ability to overcome challenges and effect change (self-efficacy),(4)reflective practices to plan and evaluate one's own actions (metacognitive strategies), as well as the (5)autonomy to act independently in learning and personal contexts (autonomy). Table 2 shows examples of the items used for measurement in relation to each of these dimensions.

Table 2. Items assessed in relation to the dimensions "self-management for lifelong learning".

Basic Skills Assessed on the Key-Skills 2030 scale		Definition of Dimensions
sm-4	I know my strengths and how to use them to achieve my goals.	Goal Setting. The ability to set goals effectively is anchored in a person's belief in their ability to succeed (Locke and Latham, 2002).
sm-5	I have long-term goals.	
sm-2	I calm others in stressful situations.	Self-Regulation. Self-regulation involves the modulation and regulation of emotions, thoughts and behaviours in pursuit of set goals (Zimmerman, 2000).
sm-9	I plan my time and the steps to take when I have to solve a situation.	
sm-1	I can maintain my performance during difficult situations.	Self-Efficacy. Self-efficacy fosters motivation and persistence to cope with difficulties and to sustain effort towards achievement in the challenges they are willing to take on (Bandura, 1993).
sm-6	With effort and time I can achieve my objectives and goals.	
sm-7	Despite the obstacles, I persist if I am convinced of how to act.	
sm-3	My experiences and learnings serve as a reference for me in dealing with new situations.	Metacognition. Metacognition makes it possible to recognise which strategies are best suited to certain contexts or goals, thus fostering an active, reflective and constructive attitude towards learning (Efklides, 2011).
sm-8	I have the ability to independently manage complex tasks.	Autonomy. Autonomy involves managing educational and career trajectories with an understanding of the interconnectedness between work and non-work roles (Hirschi et al., 2020).
sm-10	I make decisions on my own merits, taking the risks if I am wrong.	

In its relation to digitalization, a multitude of studies have supported the idea that digitalization enhances learner autonomy by providing resources and environments where learners can control their own pace and style of learning. However, can self-management support readiness for quality digitalization? Nguyen et al. (2023) emphasize that digital literacy, digital openness, and autonomous learning are key to fostering digital creativity among students. Imjai

et al. (2024) point out that digital literacy, combined with self-managed learning, contributes significantly to better career outcomes in digitally mediated work environments. Chui et al. (2024), proposed a model where self-determination mediates the development of teachers' digital competences aimed at the use of AI and the metaverse in education. Taking into account the literature reviewed, we hypothesize:

H1. Self-management (SM) has a positive relationship with Quality Digitalization (QD).

Key Competences and Quality Digitalization

We consider a "key competence" to be one that is distinctive, multifunctional, and essential for achieving successful performance and a positive outcome related to a particular endeavor in various contexts (Sala et a., 2020). Although competences change their taxonomy across disciplines (Handel, Valerio and Sanchez, 2016), Europe updated the key competences for lifelong learning, including creative thinking, critical thinking, communication, and collaborative work among them (European Commission, 2021). Labor market forecasts in 2030 consider them as "Higher Cognitive Skills" because they will enable individuals to distinguish themselves from what automated systems and intelligent machines can do or to use artificial intelligence to generate major innovations (Dondi, M. et al, 2021). Table 3 shows examples of the items used in relation to the dimension of each of these competences.

Table 3. Items assessed in relation to the dimensions considered in Key Competences 2030.

Basic Skills Assessed on the Key-Skills 2030 scale		Definition of Dimensions
Communication (COM)		
com-1	I listen with interest to different feelings and opinions.	Communication has been defined as the ability to listen and transmit information, adapting messages according to the audience, the context and with the purpose of promoting inclusion and respect in all types of multicultural interactions (Sala et al. 2020). It encompasses dimensions such as active listening, use of effective communication methods, appropriateness to audience and context.
com-2	I express my feelings and rights in a calm and confident manner.	
com-3	I produce academic texts, respecting spelling and grammatical rules in different languages.	
com-4	I show intellectual honesty and scientific rigour in all communication.	
com-5	I adapt my presentations to the context and language of the audience.	
com-6	I manage time and pace in my presentations, adapting to the context and language.	
com-7	I express my ideas with comprehensible arguments.	
com-8	In a situation of disagreement, I remain calm in what I say and how I say it.	
Collaborative Work (CW)		
cw-1	I adapt to the roles, rules and functioning of my work team.	Collaborative Work (CW) has been defined as the ability to co-participate in collective activities and undertakings, and to encourage others to collaborate, pooling knowledge, skills and resources, in order to achieve a common goal (Sala et al., 2020). It encompasses dimensions such as adaptability, proactivity, shared leadership and respect.
cw-2	I am realistic, in terms of my own and collective tasks, when working collaboratively.	
cw-3	Achieving common goals is key in group work.	
cw-4	I bring my ideas and knowledge to contribute to the effectiveness of the team.	
cw-5	I exchange information and share my resources in working groups.	
cw-6	I mobilise others in the design and development of an action plan.	
cw-7	I co-evaluate the development and the results obtained in the group work.	
cw-8	I believe in the potential of diversity.	
cw-9	I take individualities into account when coordinating a team.	
Creative Thinking (CreT)		
cret-1	I analyse advantages and opportunities of changes in a situation.	Creative thinking (CreT) has been defined as the ability to develop novel ideas, synthesise and combine concepts and information from different sources, putting them into practice to solve problems (Sala et al., 2020). It encompasses dimensions such as innovation to develop new solutions and entrepreneurship to put them into practice.
cret-2	To face new challenges, I readjust my expectations, modifying ideas or procedures.	
cret-3	I put new ideas into practice, integrating concepts and procedures that I learn.	
cret-4	I constantly evaluate opportunities to develop my creative potential.	
cret-5	I take advantage of available resources to propose strategies and/or projects.	
cret-6	I combine knowledge from different areas to propose changes or new adaptations.	
cret-7	I am motivated to discover and understand working procedures of other groups or different areas.	
cret-8	I look for new actions that contribute to the improvement of my work or environment.	
Critical Thinking (CriT)		
crit-1	To reflect on a situation, I first observe systematically.	Critical thinking (CriT) has been defined as the ability to adequately manage complex problems, exchange points of view, assume reasoned positions and reach conclusions based on evidence (Sala et al, 2020). It encompasses dimensions such as comparing, analysing, evaluating and synthesising to draw logical conclusions.
crit-2	I analyse the causes of a problem, gathering information that allows me to understand it.	
crit-3	I select relevant elements for an objective understanding of a problem.	
crit-4	I formulate hypotheses when explaining a problem.	
crit-5	I analyse and contrast information before solving a problem.	
crit-6	Solutions to a problem should include the process for implementing them.	
crit-7	I analyse the results of the solutions I propose.	
crit-8	I argue my conclusions with data and evidence.	
crit-9	Before acting, I assess several possible alternatives.	
crit-10	I analyse the scope and consequences of my proposals.	

Digital skills and key competences are intertwined in lifelong learning in this technological era (Sala et al., 2020). For Weber et al. (2022), digital competence is structured around communication and collaboration to interact globally or solve problems together, creative thinking in the creation of digital content or critical thinking to ensure a secure analysis of information. Vuorikari, R., Kluzer, S. and Punie, (2022) consider these key competences inherent to digitalization in the new context of artificial intelligence, with the ability to communicate clearly, the regular mastery of digital tools in collaborative contexts, and the exchange of constructive and trustworthy opinions being essential to be able to work together in digital environments. In this case we hypothesize that:

H2. Key competences have a positive relationship with Qualitative Digitalization.

Key Competences vs Self-Management

The way in which individuals manage their competences is central to lifelong learning. In higher education, equipping students with different skills, such as self-management and competences, can enable them to transfer easily from the educational context to the work context Konstantinou and Miller (2021). The students themselves in the study indicated the need for further reflection and acquisition of communication skills in online environments. Interestingly, skills that are not formally learnt or assessed but are related to the ability to network or be part of a team. The literature shows different perspectives on how self-management and competences are related. For example, Ibarra-Sáiz et al. (2020), in a peer assessment context whereby students critically analyzed their own and their peers' work, considered self-regulation as a mediator in competence development. In the review of Hirschi and Koen (2021) the authors presented an integrative framework of self-regulation where skills are inherent to professional self-management. For Peterson et al. (2021) self-management, competence and self-control are indispensable components for individuals to act purposefully in the face of educational, professional or life challenges. Based on the order in which these relationships are established, competence promotes self-management, as intrinsic motivation is underpinned by feelings of competence and a sense of autonomy over actions (Ryan and Deci, 2000). Accordingly, we propose that:

H3. Key competences have a positive relationship with self-management.

H3.b. Through self-management, key competences improve their relationship with quality digitalization.

Intellectual Styles and Quality Digitalization

One of the most relevant variables in the literature on the preferences of individuals in the use of their skills are the thinking styles supported by the Theory of Mental Self-Governance (Sternberg, 1988). The thirteen styles originally identified by the theory were regrouped into three dimensions according to the degree of structure, complexity, and autonomy in the processing of information and the ways of dealing with new learning (Zhang and Sternberg, 2005). Intellectual style type I is characterized by preferring tasks with low degrees of structure that require them to process information in a complex manner and allow them high levels of originality and autonomy. Intellectual style type II, on the other hand, shows a preference for structured tasks where information processing is simpler and conforms to the indications of others. Finally, Type III intellectual style manifests characteristics of Type I and II, depending on the demands of a specific task and individual interest in the task. In this study we will explore Type I intellectual styles as research has shown their relationship with perceived intellectual competence (Zhang et al., 2019), with intrinsic motivation through competence and autonomy (Domenech-Betoret and Gomez-Artiga, 2014) and even with research productivity (Zhang and Shin, 2015). Moreover, its close relationship with vocational identity has shown that it could facilitate collaborative work between academics and career counsellors to achieve holistic development among students (Zhang et al., 2022). Table 4 shows examples of the thinking styles included in this dimension.

Table 4. Examples of Thinking styles in relation to Intellectual Styles Type I

Thinking Styles Inventory (Thinking Styles Inventory, Sternberg 1997)		Dimension	Defining the thinking style
Item ID	Description of some of the items used in the survey		
Global Thinking Style (TS-global)		Level	Preference for paying more attention to the overall picture of a topic and to abstract ideas.
ts-glob	I like situations or tasks where I don't have to take care of details.		
Hierarchical Thinking Style (TS-hierarchical)		Form	Preference for prioritising and distributing attention among various tasks.
ts-hier 1	When expressing or writing ideas, I like to organise all aspects according to their importance.		
Judicial Thinking Style (TS-judicial)		Function	Preferences for working on tasks that allow them to evaluate and judge the performance of other people.
ts-jud 1	I like to test and evaluate opposing ideas or points of view.		
Legislative Thinking Style (TS-legislative)		Function	Preferences for working on tasks that require creative strategies and activities chosen by themselves.
ts-leg 1	When I make decisions, I tend to rely on my own ideas and ways of doing things.		
Liberal Thinking Style (TS-liberal)		Leaning	Preference for working on tasks that involve novelty and ambiguity.
ts-lib 1	I enjoy working on projects that allow me to try new ways of doing things.		

Although there are no previous studies that relate the variables in our study as defined, it can be deduced from the review carried out by Hirschi and Koen (2021), that personal factors (such as intellectual styles could be considered) affect self-management and are predictors of new professional orientations such as those requiring qualitative digitalization. On the other hand, a multitude of research shows that Type I intellectual styles have an important relationship in the development of key competences such as critical thinking (Zhang, 2003), creativity (Zhang, 2015) or collaboration (Jung et al., 2021). Specifically, these styles effectively integrate new knowledge and skills in both familiar and new contexts, making them more adaptive in complex digital environments. They predict academic performance in online courses (Richmond and Conrad, 2012), students' self-efficacy in career decision-making (Fan, 2016) or knowledge creation (Santos, Horta and Zhang, 2021) so taking them into account as personal factors that may influence readiness for new digital challenges is crucial. Therefore, we hypothesize:

H4. Type I intellectual styles show a positive relationship with the key competences. Therefore, these styles, through the key competences, will enhance a positive relationship with Quality Digitalization (H4b).

H5. Type I intellectual styles show a positive relationship with Self-management. In this case, through the key competences, they improve their relationship with Self-management (H5b).

Therefore, taking into account the above relationships, we consider that the individual patterns that best predict quality digitalization would be:

H6. Type I Intellectual Styles have a positive relationship with Quality Digitalization (QD); however, through key competences and self-management, they can predict QD (H6b).

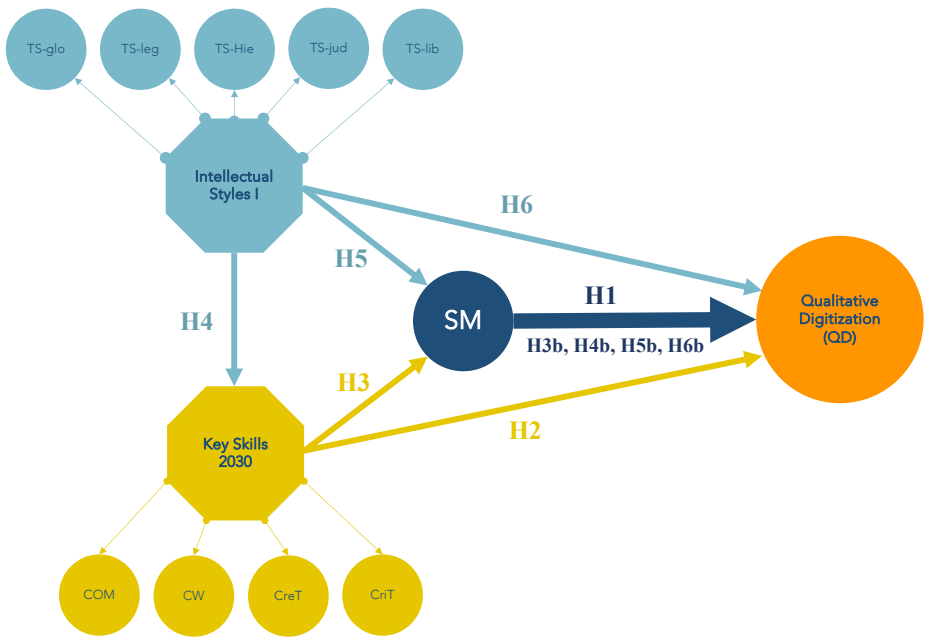


Figure 1. Proposed Model.

METHODOLOGY

Sample and Procedure.

The study involved a sample of university students aged 18-49 years of different genders, courses, and degrees (Table 5), enrolled in the Faculty of Economics and Business Studies of a Spanish public university. The sampling method and data collection were executed in the 2020/2021 academic year, using online platforms to distribute surveys and collect responses. Students received emails detailing the nature of the study, guaranteeing anonymity, confidentiality of responses and clarifying the voluntary nature of their participation (Podsakoff et al., 2003). Concise, clear, and separate instructions were provided in two different stages to prevent response fatigue (Terglav, Konečnik and Kaše, 2016). In addition to the above measures, Harman's single factor test and exploratory factor analysis for first-order constructs also confirmed the absence of common method bias (Podsakoff et al., 2003). After eliminating those questionnaires not fully completed, the final sample of 208 students was considered adequate and robust for exploratory research in higher education (Hair, Risher, Sarstedt and Ringle, 2019; Ghasemy et al., 2020).

Table 5. Characteristics of the sample.

Respondent Demographics	208	%		208	%
Gender			Degree		
Female	133	64%	GADE	77	37.02%
Male	75	36%	GMIM	35	16.83%
Age			GECO	25	12%
18 -20	84	40.38%	GTUR	17	8.17%
21-22	70	33.65%	GFICO	13	6.25%
23- 49	54	25.96%	GADE-Law	21	10.10%
Year in program			GADE-Engineering	20	9.61%
1	44	21.15%			
2	33	15.87%			
3	57	27.40%			
4	62	29.81%			
5	12	5.77%			

Measurements

Quality digitalization (QD), self-management (SM) and key competences (CreT, CriT, CW, COM) were assessed using the Key Skills-2030 inventory, developed from the comprehensive review indicated in the theoretical background. A 7-point Likert scale (1=Strongly Disagree to 7=Strongly Agree) was used for their measurement. Type I intellectual style (TS-global, TS-hierarchical, TS-judicial, TS-legislative, TS-liberal) was analyzed using the Thinking Styles Inventory (Sternberg, 1997) with a 7-point Likert scale (1=Strongly disagree to 7=Strongly agree).

Analytic Strategy

The Partial Least Squares Structural Equation Modelling (PLS-SEM) technique was used as its main purpose is predictive causal analysis where the problems analyzed are complex and theoretical knowledge may be scarce (Hair, Risher, Sarstedt and Ringle, 2019). Furthermore, PLS-SEM focuses on maximizing the explained variance of the dependent constructs, which makes it particularly useful for exploratory predictive modelling (Sharma et al., 2022; Shmueli et al., 2019). The software used was Smart-PLS (version 4.1.0.2).

RESULTS

Measurement models

1. First-order measurement model.

Taking into account the recommendations of Hair et al. (2019), all measures were reliable (table 6), with Dijkstra-Henseler's values (Rho-A) above 0.7 ensuring correlation between the estimated composites in reflective mode (Dijkstra and

Henseler 2015). Internal consistency was demonstrated with Cronbach's alpha values (Cronbach's **α** > 0.7 according to Cohen (1992) and composite reliability (Composite Reliability: Rho_c > 0.7 to ensure internal consistency reliability according to Hair et al., 2014) above 0.7. Convergent validity, assessed through the Average Variance Extracted (AVE > 0.5 ensures convergent validity at the construct level according to Gefen et al. 2000) showed that all first-order constructs explain at least 50% of the variance of their items. Discriminant validity, through the Heterotrait-Monotrait (HTMT) correlations ratio, showed values below 0.90 and the Bootstrap confidence intervals in HTMT ensured a robust assessment of the quality of the measurement model. The individual reliability of each indicator was significant and loaded above 0.6 except for the item (sm-8: loading = 0.582). Considering research related to higher education Ghasemy et al. (2020) suggest that indicators with loadings of 0.4 to 0.7 should only be removed if their exclusion from the model increases the composite reliability to more than 0.7, which was not necessary in our case.

Table 6. First order variable measurement model.

Reliability and convergent validity					
Constructs / Items	loadings	Cronbach's **α**	Reliability coefficient (Rho_a)	Composite Reliability (Rho_c)	AVE
Qualitative Digitisation (QD)		0,881	0,893	0,905	0,547
qd-1	0,805***				
qd-2	0,606***				
qd-3	0,737***				
qd-4	0,658***				
qd-5	0,771***				
qd-6	0,785***				
qd-7	0,792***				
qd-8	0,738***				
Self-Management (SM)		0,891	0,897	0,911	0,508
sm-1	0,658***				
sm-2	0,704***				
sm-3	0,803***				
sm-4	0,727***				
sm-5	0,719***				
sm-6	0,778***				
sm-7	0,78***				
sm-8	**0,582*** **				
sm-9	0,663***				
sm-10	0,682***				

KEY COMPETENCES (KC-2030)					
Communication (COM)		0,882	0,887	0,907	0,55
com-1	0,666***				
com-2	0,663***				
com-3	0,743***				
com-4	0,741***				
com-5	0,809***				
com-6	0,804***				
com-7	0,791***				
com-8	0,703***				
Collaborative Work (CW)		0,897	0,907	0,917	0,555
cw-1	0,758***				
cw-2	0,731***				
cw-3	0,781***				
cw-4	0,856***				
cw-5	0,881***				
cw-6	0,638***				
cw-7	0,668***				
cw-8	0,657***				
cw-9	0,694***				

Creative Thinking (CreT)		0,904	0,908	0,923	0,6
cret-1	0,755***				
cret-2	0,734***				
cret-3	0,794***				
cret-4	0,763***				
cret-5	0,742***				
cret-6	0,825***				
cret-7	0,752***				
cret-8	0,826***				
Critical Thinking (CriT)		0,923	0,927	0,936	0,594
crit-1	0,717***				
crit-2	0,854***				
crit-3	0,817***				
crit-4	0,65***				
crit-5	0,803***				
crit-6	0,784***				
crit-7	0,768***				
crit-8	0,688***				
crit-9	0,823***				
crit-10	0,78***				
INTELLECTUAL STYLES I (IS Type I)					
Global Thinking Style (TS-global)		0,906	0,912	0,93	0,727
ts-glob 1	0,873***				
ts-glob 2	0,862***				
ts-glob 3	0,858***				
ts-glob 4	0,813***				
ts-glob 5	0,855***				
Hierarchical Thinking Style (TS-hierarc		0,832	0,861	0,875	0,542
ts-hier 1	0,601***				
ts-hier 2	0,797***				
ts-hier 3	0,809***				
ts-hier 4	0,616***				
ts-hier 5	0,816***				
ts-hier 6	0,761***				
Judicial Thinking Style (TS-judicial)		0,895	0,912	0,92	0,661
ts-jud 1	0,854***				
ts-jud 2	0,852***				
ts-jud 3	0,617***				
ts-jud 4	0,869***				
ts-jud 5	0,893***				
ts-jud 6	0,759***				
Legislative Thinking Style (TS-legislat		0,804	0,813	0,859	0,504
ts-leg 1	0,698***				
ts-leg 2	0,751***				
ts-leg 3	0,755***				
ts-leg 4	0,658***				
ts-leg 5	0,675***				
ts-leg 6	0,716***				
Liberal Thinking Style (TS-liberal)		0,898	0,924	0,92	0,659
ts-lib 1	0,803***				
ts-lib 2	0,867***				
ts-lib 3	0,814***				
ts-lib 4	0,839***				
ts-lib 5	0,811***				
ts-lib 6	0,73***				

Notes: One-tailed test *p<0.05 **p<0.01 ***p<0.001

Discriminant validity for first-order reflective variables

HTMT ratio

	COM	CW	CreT	CriT	QD	SM	TS-glo	TS-hier	TS-jud	TS-leg	TS-lib
COM											
CW	0,899										
CreT	0,828	0,884									
CriT	0,793	0,824	0,891								
QD	0,732	0,686	0,82	0,812							
SM	0,838	0,875	0,877	0,895	0,745						
TS-glo	0,146	0,237	0,268	0,113	0,124	0,211					
TS-hier	0,38	0,347	0,405	0,481	0,424	0,406	0,1				
TS-jud	0,275	0,29	0,359	0,356	0,226	0,365	0,063	0,529			
TS-leg	0,392	0,347	0,446	0,368	0,363	0,48	0,127	0,61	0,589		
TS-lib	0,332	0,349	0,459	0,312	0,328	0,372	0,107	0,415	0,586	0,656	

2. Higher order measurement model.

As a result of the measurement model of the first-order exogenous variables, the higher-order constructs (Table 7) were analyzed following the indications of the specialized literature on models with reflective variables (Hair et al., 2019).

- The composite construct "KC - 2030" showed that the composite reliability was 0.95, which confirmed the internal consistency of the items within this construct. Furthermore, the average variance extracted (AVE = 0.827) ensured a good level of convergent validity, inferring that a substantial amount of variance in the indicators is explained by the construct. The individual reliability of each factor was above the recommended benchmark of 0.7. Cronbach's alpha and Rho_A values also validated the reliability of the construct. These results confirmed its suitability as a higher-order exogenous variable.

- The composite construct "Intellectual Styles-Type I" required the elimination of the factor "TS-glo" as it showed a negative individual loading (-0.183) below 0.5, indicating that it does not share sufficient common variance with the latent construct. Taking into account the assumptions of the theory (Stermberg, 1997) and other studies related to intellectual styles (Zhang and Sternberg, 2005), it was decided to remove it, which improved the overall consistency and reliability of the higher-order composite construct. The rest of the factors showed adequate individual reliability (all loadings were above the

threshold of 0.7) and internal consistency (Cronbach's and Rho_A > 0.7). The Average Variance Extracted (AVE > 0.5) suggested that the construct captures more than half of the variance of its indicators and therefore possesses good convergent validity. Therefore, after the elimination of "TS-glo", we conclude that the higher-order construct "Intellectual Styles-Type I" was sufficiently robust.

- Self-Management (SM)" and "Qualitative Digitalization" (QD) were analyzed with their respective second-order factors, following the indications of the specialized literature to make a more parsimonious model (Ringle et al., 2023).

Table 7. Measurement Model of higher order variables.

7.1. Reliability and convergent validity of higher order variables.

Constructs / Items	Individual Reliability	Sample mean (M)	Std. deviation (STDEV)	t-statistics (|O/STDEV|)	p-values	2.5%	97.5%
Key Competences (KC - 2030)							
CW	0,915	0,915	0,015	61,804	0	0,882	0,94
CreT	0,924	0,923	0,011	87,332	0	0,901	0,942
CriT	0,908	0,908	0,015	61,164	0	0,876	0,934
COM	0,891	0,89	0,021	43,368	0	0,845	0,924
Intellectual Style Type I (IS - Type I)							
TS-Hier	0,772	0,772	0,043	17,826	0	0,674	0,844
TS-Jud	0,768	0,764	0,042	18,07	0	0,671	0,837
TS-leg	0,826	0,824	0,028	29,469	0	0,761	0,871
TS-lib	0,784	0,782	0,035	22,238	0	0,704	0,842
Self-Management (SM)	1	1	0	n/a	n/a	1	1
Quality Digitalization (QD)	1	1	0	n/a	n/a	1	1

Constructs	**Cronbach's α**	Sample mean (M)	Std. deviation (STDEV)	t-statistics (|O/STDEV|)	p-values	2.5%	97.5%
KC - 2030	0,93	0,93	0,011	86,783	0	0,906	0,948
QD	1	1	0	n/a	n/a	1	1
SM	1	1	0	n/a	n/a	1	1
IS - Type I	0,797	0,795	0,028	28,918	0	0,736	0,843

Constructs	**Reliability coefficient (Rho_a**	Sample mean (M)	Std. deviation (STDEV)	t-statistics (|O/STDEV|)	p-values	2.5%	97.5%
KC - 2030	0,933	0,933	0,01	93,363	0	0,911	0,95
QD	1	1	0	n/a	n/a	1	1
SM	1	1	0	n/a	n/a	1	1
IS - Type I	0,802	0,808	0,029	28,111	0	0,749	0,859

Constructs	**Reliability coefficient (Rho_c**	Sample mean (M)	Std. deviation (STDEV)	t-statistics (|O/STDEV|)	p-values	2.5%	97.5%
KC - 2030	0,95	0,95	0,007	131,261	0	0,934	0,963
QD	1	1	0	n/a	n/a	1	1
SM	1	1	0	n/a	n/a	1	1
IS - Type I	0,867	0,866	0,016	54,587	0	0,832	0,894

Constructs	**AVE**	Sample mean (M)	Std. deviation (STDEV)	t-statistics (|O/STDEV|)	p-values	2.5%	97.5%
KC - 2030	0,827	0,826	0,022	38,09	0	0,781	0,866
QD	1	1	0	n/a	n/a	1	1
SM	1	1	0	n/a	n/a	1	1
IS - Type I	0,621	0,619	0,032	19,518	0	0,555	0,679

7.2. Discriminant validity of higher order variables.

HTMT ratio

	KC - 2030	QD	SM	TS I
KC - 2030				
QD	0,792			
SM	0,897	0,677		
IS - Type I	0,54	0,424	0,522	

HTMT (Confidence Intervals)

	Original sample (O)	Sample mean (M)	2.5%	97.5%
QD <-> KC-2030	0,792	0,792	0,759	0,89
SM <-> KC-2030	0,897	0,897	0,861	0,927
SM <-> QD	0,677	0,676	0,616	0,78
IS - Type I <-> KC-2030	0,54	0,542	0,392	0,676
IS - Type I <-> QD	0,424	0,45	0,305	0,587
IS - Type I <-> SM	0,522	0,524	0,379	0,655

Structural Model

The results of the bootstrapping analysis (10000 samples, two-tailed) confirmed the absence of collinearity between constructs (VIF < 5 according to Hair et al. 2019). Structural relationships were significance in three of the five direct relationships hypothesized (Table 8). Respect to QD, key competences showed a significant result (H2) in contrast to SM (H1). Key competences also showed a direct relationship with SM, standing out especially for the size of their effect (H3). As for intellectual styles, confirmed their direct relationship with key competences (H4) but not with self-management (H5). Control variables were not significant, indicated that the results may be generalizable.

Table 8. Structural model results.

Hypothesis Testing	VIF	β	STDEV	t-values (|O/STDEV|)	Confident Intervals		f2
					2.5%	97.5%	
H2. KC – 2030 > QD	3,966	0,043	0,097	0,448	-0,151	0,229	0,001
H3. KC – 2030 > SM	4,108	0,709***	0,09	7,871	0,533	0,883	0,298**
H4. IS-Type I > KC – 2030	1,312	0,833***	0,032	26,151	0,765	0,89	2,081***
H5. IS-Type I > SM	1	0,487***	0,061	7,999	0,377	0,613	0,312**
H6. IS-Type I > QD	1,312	0,08	0,046	1,723	-0,008	0,173	0,02
Control's Variables							
course -> PID	1,162	-0,009	0,042	0,226	-0,091	0,072	0
gender -> PID	1,022	0,021	0,088	0,24	-0,152	0,192	0,001
degree -> PID	1,158	-0,071	0,044	1,602	-0,156	0,019	0,012

Notes: One-tailed test *p<0.05 **p<0.01 ***p<0.001

Overvall Fit

SRMR	Original sample (O)	Sample mean (M)	95%	99%
Saturated model	0,035	0,031	0,038	0,041
Estimated model	0,037	0,036	0,045	0,051

Since SM did not show a direct relationship with QD (H1), this affected all hypotheses predicting indirect relationships through SM (see table 9). Specifically, SM did not enhance the relationship of KS- 2030 with QD (H3b) nor did it predict the relationship of IS Type I with QD (H6). On the other hand, key competences facilitated both the relationship of intellectual styles with QD (H4b) and with SM (H5b). The variance rates explained in H4b (VAF = 88 %) and H5b (VAF = 83 %) suggest that the relationship of Type I Intellectual Styles with both QD and SM is fully mediated by KS-2030.

Table 9. Mediation Analysis

Hypothesis Testing	β	Sample mean (M)	Std. deviation (STDEV)	t-statistics (|O/STDEV|)	p-values	Confident Intervals		VAF
Direct Effect						2.5%	97.5%	
H2. KC – 2030 > QD	0,709	0,71	0,09	7,871	0	0,533	0,883	
H3. KC – 2030 > SM	0,833	0,827	0,031	26,572	0	0,761	0,883	
H4. IS-Type I > KC – 2030	0,487	0,475	0,062	7,604	0	0,347	0,59	
H5. IS-Type I > SM	0,08	0,081	0,046	1,723	0,085	-0,008	0,173	
H6. IS-Type I > QD	0,023	0,025	0,047	0,489	0,625	-0,067	0,116	
Indirect Effect								
H3b. KC – 2030 > SM > QD	0,041	0,039	0,081	0,511	0,61	-0,123	0,198	5%
H4b. IS-Type I > KC – 2030 > QD	0,333	0,338	0,062	5,382	0	0,223	0,464	88%
H5b. IS-Type I > KC – 2030 > SM	0,389	0,393	0,051	7,586	0	0,29	0,489	83%
H6b. IS-Type I > KC – 2030 > SM > (	0,019	0,018	0,039	0,499	0,617	-0,058	0,096	5%
TOTAL EFFECT								
KC – 2030 > QD	0,75	0,749	0,038	20,005	0	0,671	0,818	
H6. IS-Type I > SM	0,469	0,474	0,062	7,546	0	0,346	0,591	
H5. IS-Type I > QD	0,38	0,384	0,06	6,28	0	0,262	0,498	

Notes: One-tailed test *p<0.05 **p<0.01 ***p<0.001

Regarding the explanatory power of the model within the sample, the results of the Coefficients of Determination (see table 10) were moderate for "KC - 2030" and rather robust for "SM". According to Ghasemy et al. (2020), these results make sense since R2 is based on context and the number of antecedent predictor constructs. That is, an R2 of 0.221 could be considered satisfactory in predicting, as shown by the effect size results as a measure of relative impact (Hair et al., 2019). Regarding the predictive accuracy of the trajectory model through the Q-value2 combining aspects of out-of-sample prediction (Shmueli et al., 2016), the results of KC - 2030, QD and SM were substantial, particularly for KC - 2030 an SM, confirming the predictive accuracy of the model. At the level of individual indicators, in the construct KC - 2030: CreT, CriT, COM and CW all were significant in their predictive relevance, highlighting the explanatory power of creative thinking and critical thinking. Finally, data comparing loss values between PLS-SEM and average indicators provided more complete information on model performance. When comparing the RMSE values of the indicators with the LM values, none had higher RMSE values, so the model showed high predictive power (Shmueli et al., 2019). Furthermore, the goodness of fit of the model with SRMR values for the saturated model (0.035) and SRMR for the estimated model (0.037) also suggested a strong explanatory power of the model.

Table 10. Coefficient of Determination and Q^2 predict.

R-squared	Original sample (O)	Sample mean (M)	Std. deviation (STDEV)	t-statistics (|O/STDEV|)	p-values	2.5%	97.5%
KC-2030	0,221	0,229	0,058	3,795	0	0,121	0,348
QD	0,598	0,61	0,047	12,762	0	0,514	0,698
SM	0,755	0,757	0,032	23,79	0	0,691	0,814
Q^2 predict	Q^2predict	RMSE	Std. deviation (STDEV)	kurtosis	Asymmetry	Cramér-von Mises'Test	Cramér-von Mises'p values
KC-2030	0,209	0,902	0,476	0,253	-0,61	2,843	0
QD	0,126	0,944	0,402	0,55	-0,586	2,52	0
SM	0,208	0,903	0,476	0,281	-0,615	2,844	0
Q^2 predict (factors)							
CW	0,133	0,936	0,434	0,297	-0,61	2,797	0
CreT	0,217	0,889	0,437	0,292	-0,607	2,73	0
CriT	0,184	0,909	0,43	0,308	-0,614	2,744	0
COM	0,15	0,927	0,422	0,3	-0,611	2,785	0
SM	0,206	0,896	0,474	0,327	-0,619	2,79	0
QD	0,125	0,939	0,398	0,6	-0,589	2,452	0
Summary CVPAT LV - PLS-SEM vs. average of indicators							
	PLS Loss	AI Loss	Average Loss Difference	t value	p value		
KC-2030	0,838	1,008	-0,17	3,004	0,003		
QD	0,882	1,008	-0,125	2,204	0,029		
SM	0,802	1,008	-0,206	2,987	0,003		
General	0,84	1,008	-0,168	3,052	0,003		
Summary CVPAT LV - PLS-SEM vs. Linear model (LM)							
	PLS Loss	LM Loss	verage Loss Differen	t value	p value		
KC-2030	0,838	0,874	-0,036	2,502	0,013		
QD	0,882	0,897	-0,015	0,58	0,562		
SM	0,802	0,841	-0,039	2,729	0,007		
General	0,84	0,872	-0,033	2,394	0,018		
Assessment of predictive power							
	PLS-SEM_RMSE	LM_RMSE	LM - SEM				
CW	0,936	0,961	-0,025	According to Shmueli et al. (2019) high predictive power			
CreT	0,889	0,898	-0,009				
CriT	0,909	0,926	-0,017				
COM	0,927	0,953	-0,026				
SM	0,896	0,917	-0,021				
QD	0,939	0,947	-0,008				

CONCLUSIONS

The main objective of this study was to explore individual variables that favor willingness to quality digitalization in university students of different genders, degrees and year in program. Two of these variables, self-management and Type

I intellectual styles, did not show direct relationships with digitalization. The key competences, however, did show the expected impact, demonstrating that they not only exert a significant effect directly on Quality Digitalization, but also function as mediators in the relationship between Type I Intellectual Styles.

Implications

These findings support Vuorikari, Kluzer and Punie's (2022) consideration of the importance of these competences in higher education to ensure that students are not only consumers of digital content but also critical innovators in digital contexts. Similarly, it supports suggestions of Sala et al. (2020) on the need to integrate key competences into educational pathways as an essential part of lifelong learning. Responding to Bygstad et al. (2022), our results suggest that teaching students how creative, critical thinking, communication and collaborative work are part of quality digital learning would help them improve their own ability to work in complex digital environments.

On the other hand, our results revealed that key competences facilitate self-management. This supports Peterson et al.'s (2021) proposal on the interdependence between self-management and competences. As Konstantinou and Miller (2021) point out, the potential lies in how to make this evident in practice. We share with the authors the proposal to use a model of reflection on the relationship of key competences within the digital context in the world of work. It is possible that type I intellectual styles have a lot to do with establishing these deeper relationships to make decisions in your future, as Fan (2016) indicated. However, by themselves, type I intellectual styles did not demonstrate a direct relationship with self-management in our study. These more complex and creativity-oriented thinking styles required a disposition toward key competence for the relationship with self-management to be significant. This pattern, type I

intellectual style-key competence-self-management, predicted better results in our sample, providing novel information to the relationships estimated in self-management´s literature. Regarding the relation between type I intellectual styles and key competencies, the results contribute to research that highlights the importance of adapting educational methods to foster style profiles that facilitate greater autonomy and ability (Zhang and Sternberg, 2005) and it is therefore essential that teachers offer methodologies that favor orientation towards these styles. As Sternberg (1997) indicated, the best way to do it is to promote teaching that respects differences in thinking styles.

Limitations and Future Lines of Research

Given that there may be cultural differences that influence learning approaches and stages of digitalization development of students from different countries (Zhang and Watkins, 2001), the cross-cultural evidence is necessary. On other hand, research has shown that belief in one's own competence can strongly influence both motivation and effectiveness in learning (Kunter et al., 2013). In line to Ibarra-Sáiz et al. (2020), the construction of value judgement requires confidence in one's own judgement and confidence in the judgement of others, therefore, more longitudinal research would add value.

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Investigar para crear metodologías

funcionales al servicio de las personas.

(López Cárdenas and Haro-Domínguez, 2024).

Capítulo 5


limitaciones
futuras investigaciones
implicaciones
conclusiones

CAPÍTULO 5 ▷ CONCLUSIONES.

El enfoque de esta tesis ha estado dirigido a buscar variables individuales que faciliten la inclusión al contexto laboral 2030. El aprendizaje permanente es un hecho tanto en las políticas propuestas por la Unión Europea como en los análisis globales que prevén cambios sustanciales en la próxima década. Los futuros egresados, ya sean empleadores o empleados, deberán adoptar medidas profesionales audaces para prosperar en el futuro. La importancia crítica del desarrollo continuo de habilidades y la capacidad de trabajar junto con tecnologías avanzadas como la inteligencia Artificial exigirá un modelo de autogestión donde las competencias clave evaluadas en esta tesis pueden ser determinantes.

Respondiendo a la Cuestiones iniciales.

Competencias Clave 2030

Con respecto a ¿qué competencias clave son fundamentales en el mercado laboral previsto en 2030?, el capítulo 1 mostró una revisión exhaustiva de como el Pensamiento Creativo, el Pensamiento Crítico, la Comunicación y el Trabajo Colaborativo responden a esta cuestión. A lo largo de los estudios presentados en los capítulos 2, 3 y 4, es previsible que estas competencias modulen nuevos aprendizajes e incluso direcciones vitales para encontrar, ascender o cambiar de trabajo en el futuro. En concreto:

- El Pensamiento Creativo como generador de soluciones innovadoras a problemas complejos no tiene sentido si esas soluciones no se ponen en práctica. Para cultivar un "nuevo espíritu empresarial" que esté impulsado por retos y desafíos globales, tanto la innovación como el

emprendimiento son dimensiones de la competencia creativa que precisan fomentarse al unísono en los entornos que preparan a los estudiantes para el mercado laboral del futuro. Como muestran los resultados del estudio 1 (capítulo 2), ambas dimensiones son independientes y contribuyen significativamente al constructo de orden superior, aunque el emprendimiento con un peso relativamente mayor que la innovación. Esto tiene sentido en cuanto a que los estudiantes están orientados a encontrar nuevas soluciones a problemas o situaciones, pero no necesariamente a probar sus ideas y ver hasta dónde llegan. En cualquier caso, ambas dimensiones han demostrado ser estadísticamente confiables para entender y evaluar una nueva perspectiva del pensamiento creativo (Glaveanu et al., 2020). Por otro lado, cuando el pensamiento creativo forma parte de las Competencias Clave (estudio 3, capítulo 4), cumple todos los requisitos precisos para futuras evaluaciones.

- El Trabajo Colaborativo, vital en las previsiones laborales de 2030, ha demostrado que, para optimizar la creatividad dentro de equipos, es crucial promover un ambiente donde se valore la proactividad, el respeto mutuo y el liderazgo compartido, más que simplemente adaptarse a las condiciones del grupo. Este aspecto es relevante en cuanto a la forma en que se valora la adaptabilidad en el aprendizaje a lo largo de la vida (Sala et al., 2020) o la orientación de la propia carrera (Li, Fan and Zhang, 2023). Además, facilita la inclusión de personas con preferencias diferentes a la hora de afrontar los desafíos, lo que está alineado con los ODS (UN, 2015) que relacionamos en el capítulo 1. Por otro lado, como componente de las Competencias Clave 2030, ha mostrado una base estadística sólida para inferir su impacto y su relación con otras variables.

- Respecto al Pensamiento Crítico, como habilidad cognitiva de orden superior para afrontar la incertidumbre, la complejidad y el cambio (Sala et al., 2020), ha demostrado que tanto la evaluación de argumentos como la toma de decisiones basadas en evidencia son particularmente influyentes en la orientación emprendedora individual. Su análisis estadístico indica una alta consistencia interna de los ítems utilizados y robustez de las mediciones realizadas. Además, los resultados sugieren que el pensamiento crítico como parte de las Competencias Clave (estudio 3, capítulo 4), tiene un peso significativo para facilitar la Digitalización de Calidad lo que será imprescindible en los entornos laborales previstos en la próxima década (Vuorikari et al., 2022).

- Por último, la Comunicación como capacidad para escuchar y transmitir información, adaptando los mensajes según la audiencia, el contexto y con el propósito de promover la inclusión y el respeto en todo tipo de interacciones multiculturales (Sala et al. 2020), es la cuarta competencia clave que se ha considerado fundamental es nuestro trabajo. Según se prevé en los entornos laborales, será imprescindible entrenarse en habilidades de escucha activa para recordar lo que se dice y cómo se dice, hacer preguntas relevantes para crear consenso o debate coherente y transmitir gran cantidad de información de manera concisa a todo tipo de audiencias (Dondi et al., 2021). Estas habilidades se reflejan con precisión estadística en el constructo que hemos propuesto y sería una herramienta de autoevaluación o evaluación externa valiosa en el contexto de la educación superior.

Creemos haber respondido a qué competencias son claves para los retos previstos en 2030. Hemos profundizado en su análisis y hemos demostrado que estas competencias se relacionan de forma individual o como constructo de orden superior con otras variables como la Orientación Emprendedora Individual y la Digitalización de Calidad. Es posible que la interrelación de estas competencias asegure a los estudiantes que no solo sean capaces de desempeñarse de manera efectiva en sus futuros roles, sino que también puedan liderarse a sí mismos en entornos diversos y desafiantes. Sólo estudios longitudinales podrían dar fe de ello, si se integraran en los currículos educativos de forma transversal y permanente.

Estilos de Pensamiento

En el planteamiento inicial de esta tesis, nos preguntábamos si ¿los estilos de pensamiento modulan la percepción de las competencias clave 2030? Efectivamente, teniendo en cuenta los resultados de los tres estudios analizados, los estilos de pensamiento pueden tanto limitar como propiciar el uso de las competencias clave imprescindibles para 2030. Por ejemplo, el estilo legislativo, que se enfoca en la generación de nuevas ideas y la resolución innovadora de problemas, ha demostrado tener una relación directa con el pensamiento creativo, el trabajo colaborativo y el conjunto de las competencias clave evaluadas como constructo de orden superior. Los ítems utilizados para su medida han demostrado contribuir significativamente al constructo general y muestran una capacidad predictiva adecuada en los tres estudios. En concreto, en el capítulo 2, el estilo de pensamiento legislativo destacó por la importancia que le da a la autoconfianza y la independencia en el proceso de toma de decisiones, aspectos cruciales también para la creatividad. Y es que, las personas orientadas a este estilo tienden a confiar en sus propias ideas, lo que les permite

desarrollar estrategias y soluciones únicas, imprescindibles en la innovación. De igual forma, los resultados estadísticos refuerzan esta conexión en el estudio sobre la orientación emprendedora individual (capítulo 3). La preferencia por tareas que les permitan el desarrollo de estrategias creativas y autónomas está alineado con capacidad de crear y aplicar estrategias originales en la dimensión de innovación de la orientación emprendedora. El capítulo 4 refuerza su valor dentro de los estilos intelectuales como constructo de orden superior, especialmente cuando se valora la independencia o la capacidad de generar y seguir reglas propias en la Autogestión.

De manera muy diferente, el estilo de pensamiento ejecutivo, con preferencia por tareas estructuradas o el seguimiento de normas, ha demostrado no tener una relación directa con el pensamiento creativo. Como se analiza en el capítulo 2, su tendencia a seguir procedimientos antes de empezar una tarea o proyecto contrasta con la perspectiva innovadora y emprendedora del pensamiento creativo. La literatura ha demostrado este contraste, y nuestro estudio contribuye a ello con una salvedad importante, el modelo propuesto demostró que a través de ciertas dimensiones del Trabajo Colaborativo estos estilos pueden mejorar su orientación al Pensamiento Creativo. Por tanto, con indicaciones claras de cómo hacerlo y siempre que se muestren proactivos en sus tareas, podrán enriquecer a los equipos que buscan soluciones originales a retos globales (López-Cárdenas and Haro-Domínguez, 2024).

Insistimos en una cuestión clave, no se trata de que unos estilos sean mejores que otros, lo verdaderamente importante es que las personas reconozcan sus preferencias y encuentren cómo ser más eficaces según las demandas del entorno (Sternberg, 1997). Además, los estilos pueden ser socializados, enseñados y aprendidos por lo que formar parte de equipos heterogéneos permite observar comportamientos en otros que quizás provoquen la motivación suficiente para probar nuevas formas creativas de abordar el contexto (Zhang

and Sternberg, 2006). Es posible que un modelo educativo que se centre en la excelencia para todos los estudiantes a través de estrategias pedagógicas que propicien las competencias clave, permita todo lo anterior (Sternberg, 2008). En ese sentido, parece evidente que quien dirige a esos grupos de personas deberían igualmente mostrar mentalidades abiertas y creativas que rompan las barreras de los enfoques rígidos y conservadores de las instituciones educativas del pasado (Sternberg, 2016).

Autogestión

Al inicio de este trabajo nos cuestionábamos ¿Cómo ayudarían la competencia y el estilo de pensamiento a la autogestión de aprendizajes complejos en el contexto tecnológico previsto? Si bien hemos mostrado que los estilos creativos están relacionados con las competencias clave y que estás tienen un impacto importante en la autogestión, no hemos demostrado que este patrón de "estilos – competencias – autogestión" potencie habilidades digitales demandadas en el entorno tecnológico que se prevé. Ciertamente, la Autogestión es una pieza fundamental para el aprendizaje permanente (Sala et al., 2020) y está relacionada tanto con la satisfacción laboral (Dondi et al., 2020) como con la adquisición y actualización de nuevas habilidades (ILO, 2021; WEF, 2021). Estas publicaciones, pusieron en evidencia que tras la pandemia COVID-19 era imprescindible integrar la Autogestión en programas de formación con el objetivo de preparar a las personas para futuros entornos laborales más autónomos e impulsados digitalmente. Sin embargo, cuando en aquel momento McKinsey and Co. encuestó a miles de personas de 15 países con diferentes niveles de educación, encontraron que las habilidades implícitas en la autogestión aun eran percibidas como independientes al dominio de la tecnología. Efectivamente, nuestros resultados confirman que no hay una relación directa entre la Autogestión y la

Digitalización de Calidad, al menos en nuestra muestra. Es posible que en sectores más vinculados con la tecnología exista una relación más fuerte que en otros sectores. También es posible que el período en el que se realizó este estudio precisaba de una rápida transformación digital aún no consolidada en el contexto universitario. Sólo replicando el modelo o evaluando las diferencias de los resultados a lo largo del tiempo podremos ofrecer una respuesta más exacta.

Implicaciones

Contribuciones Teóricas.

La Teoría del Autogobierno Mental (Sternberg, 1988) ha sido imprescindible a la hora de entender que no solo las competencias son importantes para las trayectorias personales y laborales de las personas. Las preferencias a la hora de usar dichas competencias también son fundamentales, siendo los estilos de pensamiento una variable distintiva de cómo los individuos se gestionan y orientan su cognición para adaptarse y responder a su entorno. Nuestros resultados contribuyen a la teoría en varios sentidos. En primer lugar, hemos confirmado que los estilos de pensamiento legislativo, judicial y ejecutivo se relacionan de forma diferente con el pensamiento creativo. El estilo legislativo impacta positivamente, a diferencia del estilo ejecutivo, lo que sugiere que en función de las preferencias por unos u otros estilos se vería potenciada la competencia creativa. Por otro lado, hemos mostrado que los estilos legislativo y liberal se relacionan positivamente con la orientación emprendedora individual, mientras que los estilos judicial y jerárquico lo hicieron a través del pensamiento crítico. Estos resultados contribuyen con información novedosa sobre nuevas relaciones, al igual que los resultados negativos pero significativos del estilo global que no se prevén dentro de la teoría. Respecto a la reagrupación de los estilos de pensamiento que propone el Modelo Triple de los Estilos Intelectuales

(Zhang and Sternberg, 2005), ciertamente los Tipo I se constatan en nuestros resultados como perfiles realmente efectivos en relación con las competencias clave. A excepción del estilo global, los estilos legislativo, judicial, jerárquico y liberal cumplieron con las exigencias estadísticas necesarias para analizarse como dimensiones independientes dentro del constructo de orden superior estilos intelectuales tipo I, lo que creemos contribuye significativamente a futuros análisis empíricos relacionados con la teoría.

Posibles Implicaciones Generales.

Teniendo en cuenta la evolución de las competencias y las previsiones analizadas en el capítulo 1, consideramos que nuestro trabajo aporta reflexiones bien justificadas en cuanto a:

Currículo Integrado por Competencias Clave. Las instituciones educativas precisan integrar la enseñanza de competencias clave y habilidades de autogestión en sus programas de estudio para preparar a los estudiantes para los desafíos laborales futuros. Probablemente, los programas educativos que mejoren las competencias de los estudiantes muestren mejores resultados para la empleabilidad en 2030, y con ello sus alumnos estén más preparados para movilizarse en el entorno laboral europeo que se propone. Además, incluyendo un enfoque del aprendizaje continuo oriente a estos a un desarrollo personal para gestionarse a sí mismos con mayor eficacia a lo largo de la vida. Esto conlleva compartir con docentes y estudiantes la actualización de los análisis del mercado laboral, identificar las competencias propias en comparación con las esperadas en entornos reales e implementar un seguimiento de los estudiantes graduados para ver sus efectos.

Evaluación Continua, Ágil y Actualizada. La implementación de evaluaciones periódicas para que los estudiantes puedan autogestionar continuamente sus competencias clave puede agilizarse con los avances tecnológicos que disponemos en esta época. Esto implica una autoevaluación de la percepción individual seguida de una respuesta inmediata sobre su correspondencia con la competencia real demandada. Los docentes pueden potenciar esta información realizando revisiones temáticas orientadas a la mejora individual en fomento de una mentalidad de crecimiento. El "aún no, pero estás en la dirección correcta" está a la base de este tipo de mentalidad y la investigación (Dweck, 2015) ha demostrado que proporciona la seguridad psicológica necesaria para que las personas sigan avanzando a lo largo de su vida.

Estrategias Pedagógicas Innovadoras. En la última resolución de la Unión Europea (2024), se menciona que las instituciones deben fomentar una educación superior inclusiva, centrada en el estudiante y su bienestar, lo cual se puede lograr mediante enfoques pedagógicos personalizados que respondan a las necesidades individuales y que innoven en esta línea. Los estilos de pensamiento han demostrado que pueden favorecer o limitar la disposición de los estudiantes al uso de las competencias clave y esta información tiene un valor potencial cuando al identificarlo se cuenta con estrategias pedagógicas personalizadas que no sólo respeten estas diferencias, sino que ofrezcan las herramientas para saber cómo redirigirlas en beneficio propio.

Implicaciones prácticas.

Como decíamos anteriormente, la última resolución de la Unión Europea incide en la necesidad de mejorar el reconocimiento de cualificaciones en la educación superior que permitan la movilidad y cooperación entre los países que la

engloban. La figura 1 recopila las propuestas más significativas que podrían relacionarse con las implicaciones prácticas de nuestro trabajo.

Figura 1. Adaptado de las propuestas para una Educación Superior de Calidad (UE, 2024).

Como puede observarse, colaboración-habilidades transversales-inclusividad y digitalización en todos los procesos están alineados con las implicaciones prácticas de esta tesis. Encontrar la forma de hacerlo posible es un hecho y lo va a seguir siendo en 2030 porque los procedimientos actuales de reconocimiento y calidad están demostrando ser complejos y costosos.

En este sentido, nuestra propuesta de **crear perfiles individualizados** que relacionen estilos de pensamiento con competencias clave encaja perfectamente con el enfoque europeo sobre micro-credenciales. Permite al estudiante reflexionar sobre su propio aprendizaje, en cuestiones como, por ejemplo:

- qué de lo que ha aprendido ha facilitado mi competencia "x"

- qué sabía y qué sé ahora sobre mi capacidad para mejorar en "x"
- cómo influyen mis preferencias a la hora de avanzar en "x" meta.
- cuál es mi potencial en relación con mis competencias "x" y mis preferencias "estilos intelectuales x" a la hora de tomar decisiones sobre mi futuro.
- ¿para qué voy a actuar en este grupo de "x" manera?, para practicar mi competencia en "x".
- cómo estoy avanzando a lo largo de este año en comparación al anterior respecto a reforzar mis competencias "x" y mi reflexibilidad a la hora de aplicarlas "estilo intelectual x"
- qué puedo mejorar en la siguiente evaluación de mi perfil

Éstas y otras cuestiones son fáciles de programar con herramientas tecnológicas, pero tienen efectividad si están sustentadas en la investigación y si se generalizan continuamente a comportamientos funcionales. Es decir, puede que una habilidad básica imprescindible sea leer de forma eficaz, pero en educación superior si el objetivo es "*cómo presentar información veraz ante un equipo de trabajo*" (ejemplo de competencia comunicación eficaz) el conjunto de habilidades necesarias para alcanzar la competencia tiene un valor funcional mayor cuando se ajusta perfectamente a la demanda en el contexto laboral real. Como decía Norris (2018), las competencias clave permiten a las personas tomar decisiones efectivas, considerar las consecuencias de sus actitudes y acciones, así como realizar cambios para restablecer trayectorias de desempeño efectivo. Y en este sentido, enseñar a los estudiantes que tienen opciones creativas, prácticas y basadas en la sabiduría para desarrollarse como potenciales trabajadores eficaces, puede alentarlos a abordar los problemas de maneras que de otro modo no habrían pensado que fuera posible (Sternberg et al. 2021).

Dados los argumentos teóricos (capítulos 2, 3 y 4) sobre cómo las competencias clave pueden favorecer nuevos aprendizajes y cómo los estilos de pensamiento potencian y relativizan su uso en el contexto real, es posible proponer un modelo ágil, dinámico y funcional (figura 2) que muestre la evolución del perfil a lo largo de la carrera en las micro-credenciales europeas. Creemos que esto tendría un valor añadido para las universidades que quieran acreditar la calidad de sus programas. Como indica "*European Education Area*", la educación superior desempeña un papel crítico en la encrucijada de la investigación y la innovación, al servicio de la sociedad y la economía. La creación de sinergias entre el Espacio Europeo de Educación (EEE), el Espacio Europeo de Investigación (EEI) y el Espacio Europeo de Educación Superior (EEES) para la configuración de economías sostenibles y resilientes, pretende que los europeos altamente cualificados tengan accesibilidad a puestos de trabajo en cualquier país o formen parte de equipos colaborativos cualificados. Debido a que Europa necesita más personas con habilidades de alto nivel, los Estados miembros de la UE se han fijado el objetivo de que para 2030, para que esta calificación se acredite en la educación superior. A tan sólo seis años para 2030, esta tesis ha intentado plasmar propuestas alineadas con esta perspectiva, investigando paralelismos con el mercado laboral real y las variables individuales que propician esa adaptación en los estudiantes universitarios.

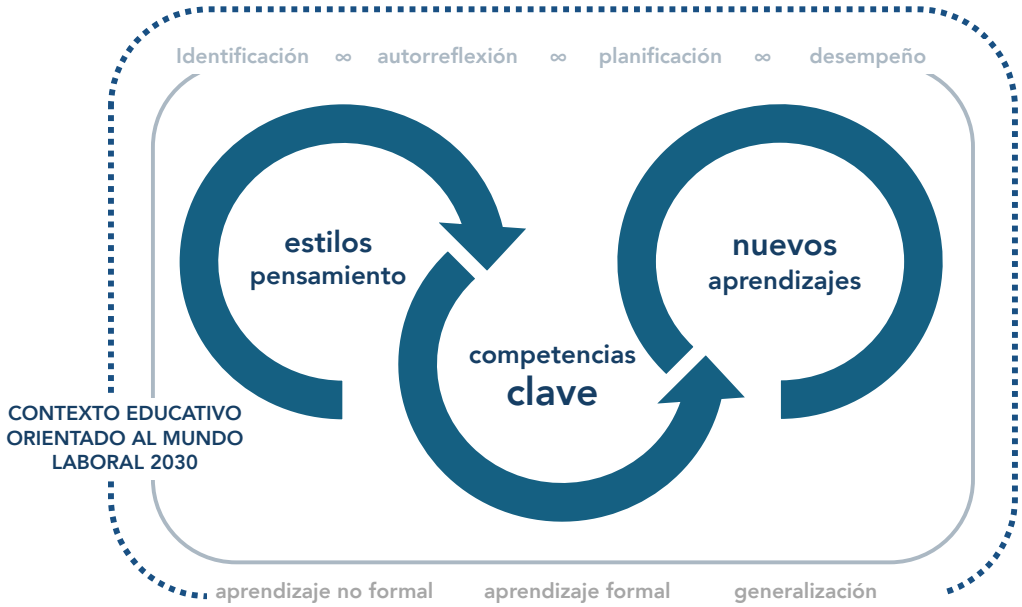

Figura 2. Propuesta de un modelo educativo orientado al mundo laboral 2030.

Limitaciones

Somos conscientes que cada uno de los estudios presentados en los capítulos 2, 3 y 4 muestran limitaciones importantes a pesar de cubrir todos los requisitos estadísticos requeridos en investigación. Por ejemplo, los sesgos de la autoevaluación es una de las limitaciones más difíciles de superar en el contexto de la investigación y en ese sentido nuestros estudios se basan en este tipo de datos. Sin embargo, cuando Bandura (1977) introdujo el concepto de autoeficacia, se refería precisamente a la creencia de una persona en su capacidad para realizar tareas y alcanzar objetivos. Dweck (2006) sugirió que las creencias sobre la capacidad y el potencial de crecimiento personal influyen directamente en el éxito y la resiliencia para superar desafíos y persistir en sus esfuerzos. Sternberg (1985; 1997) también indicó que la comprensión de uno mismo y la autopercepción de habilidades son claves para aplicar de manera efectiva las propias habilidades en contextos reales. En tal caso, creemos

humildemente que los resultados tienen valor como estudios exploratorios iniciales.

Por otro lado, podría interpretarse como una limitación el no incluir un conjunto completo de estilos de pensamiento para una comprensión más integral de las diferencias respecto a las dimensiones tipo I, II y III. Realmente la muestra mínima recomendada para realizar un estudio multigrupo debe ser superior a la nuestra y distribuida igualmente o de manera moderadamente desigual entre los grupos. Esperamos lograr una mayor potencia estadística para detectar diferencias entre los diferentes estilos intelectuales, es decir, cuando alcancemos al menos 1,000 observaciones por grupo (Klesel et al., 2022) en futuras investigaciones.

Por último, la ausencia de datos longitudinales que identifiquen las trayectorias de los estudiantes universitarios una vez se integren en el mundo laboral es una limitación relevante para entender el efecto de los modelos propuestos basados en competencias y estilos. Actualmente este tipo de estudios en el contexto universitario tiene un valor incalculable si tenemos en cuenta que para 2030 se pretende aumentar el número de personas con habilidades relevantes para el empleo (Goal 4.4 – SDG). Sólo necesitamos llevarlo a la práctica y demostrar con datos su efecto.

Futuras líneas de investigación

En respuesta a las limitaciones anteriores, futuras líneas de investigación podrían utilizar un enfoque de triangulación para abordar los problemas de la autoevaluación, integrando múltiples métodos y fuentes de datos para validar los resultados. Esto podría incluir la medida de datos obtenidos de la autoevaluación con evaluaciones de pares y supervisores, así como evaluadores externos (Amabile, 2019). Un análisis comparativo de los resultados de la

autoevaluación con otros indicadores de rendimiento académico ayudaría a identificar discrepancias y áreas de mejora (Sternberg, 1988).

Por otro lado, cada uno de los modelos propuestos son generalizables al contexto laboral en el que tanto los propios trabajadores buscan ascender o reciclarse, orientados a las competencias clave que se demandan. En tal caso, futuras líneas de investigación podrían replicar nuestro trabajo para mejorar las estrategias de los equipos de recursos humanos tanto para la identificación del talento como para el apoyo a los empleados que quieran ascender o mejorar su competencia laboral (WEF, 2021).

Por último, y como reflexión importante sobre el género como variable de control en nuestros estudios, los resultados no significativos abren una puerta de esperanza sobre la meta 5 de los ODS (Goal 5: Achieve gender equality and empower all women and girls). Las universidades siempre han sido pioneras en generar cambios sociales transcendentales para el desarrollo de las sociedades. Si la replicación de los modelos propuestos en nuestro trabajo mostrase en otros contextos universitarios los mismos resultados, podríamos responder a cuestiones importantes sobre cómo las instituciones educativas están facilitando que la igualdad se esté consiguiendo.

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APÉNDICES

CAPÍTULO 3. APENDIX I. Measurement model with first-order reflective variables.

1. Reliability and convergent validity on Individual Entrepreneurial Orientation (IEO)

Items/Samples of Items	Individual reliability	STDEV	t-values (|O/STDEV|)	Cronbach's α	Rho_A	Composite Reliability	AVE
Assumption of Risk/Responsibility (AR/R)				0,762	0,766	0,849	0,584
IEO-AR/R 1In stressful situations, I include activities that allow me to respond rationally.	0,7***	0,05	14,087				
IEO-AR/R 2. I know my weaknesses and use strategies to improve them.	0,761***	0,042	18,202				
IEO-AR/R 3. Reflexiono ante las críticas para mantener o cambiar mi punto de vista.	0,807***	0,028	29,13				
IEO-AR/R 4. I reflect on criticism to maintain or change my point of view.	0,785***	0,041	19,276				
Self-efficacy				0,881	0,884	0,908	0,584
IEO-SE 1. I know my strengths and I know how to use them to achieve my goals.	0,762***	0,038	20,154				
IEO-SE 2. I have long term goals.	0,727***	0,042	17,253				
IEO-SE 3. With effort and time I can achieve my objectives and goals.	0,787***	0,029	27,149				
IEO-SE 4. Despite the obstacles, I persist if I am convinced of how to act.	0,814***	0,024	33,282				
IEO-SE 5. I learn from my failures to improve myself and learn.	0,773***	0,037	21,083				
IEO-SE 6. I face difficult or unknown tasks with security and confidence.	0,718***	0,032	22,735				
IEO-SE 7. I defend my decisions with arguments.	0,766***	0,035	21,748				
Innovation				0,875	0,877	0,909	0,667
IEO-IN 1. I like to test my ideas and see how far they go.	0,831***	0,027	30,953				
IEO-IN 2. I propose new solutions to problems or situations.	0,86***	0,02	43,892				
IEO-IN 3. I take advantage of available resources to propose strategies and/or projects.	0,782***	0,044	17,783				
IEO-IN 4. I combine knowledge from different areas to propose changes or new adaptatior	0,84***	0,021	39,751				
IEO-IN 5. I am motivated to discover and understand work procedures from other groups	0,767***	0,039	19,432				
Proactivity				0,84	0,864	0,893	0,679
IEO-PR 1. I contribute my ideas and knowledge to contribute to the team's effectiveness.	0,91***	0,012	73,483				
IEO-PR 2. I exchange information and share my resources in work groups.	0,884***	0,019	47,075				
IEO-PR 3. I mobilize other people in the design and development of an action plan.	0,73***	0,052	14,03				
IEO-PR 4. I co-evaluate the development and the results obtained in the group work.	0,758***	0,039	19,266				

Notes: One-tailed test *p<0.05 **p<0.01 ***p<0.001

2. Discriminating Validity Assessment

HTMT

	Self-efficacy	Innovation	Proactivity	Assumption of Risk/Responsib
Self-efficacy				
Innovation	0,875			
Proactivity	0,827	0,803		
Assumption of Risk/Responsibility	0,884	0,894	0,765	

CAPÍTULO 3. APPENDIX II. Alternative models for robustness analysis.

Alternative model 1

	Saturated Model	Estimated Model
SRMR	0,057	0,116
d_ULS	2,674	11,093
d_G	1,162	2,198
Chi squared	1273,967	3611,689
NFI	0,773	0,356

Alternative model 2

	Saturated Model	Estimated Model
SRMR	0,049	0,109
d_ULS	1,993	9,814
d_G	0,914	1,117
Chi squared	878,617	1100,416
NFI	0,843	0,804

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