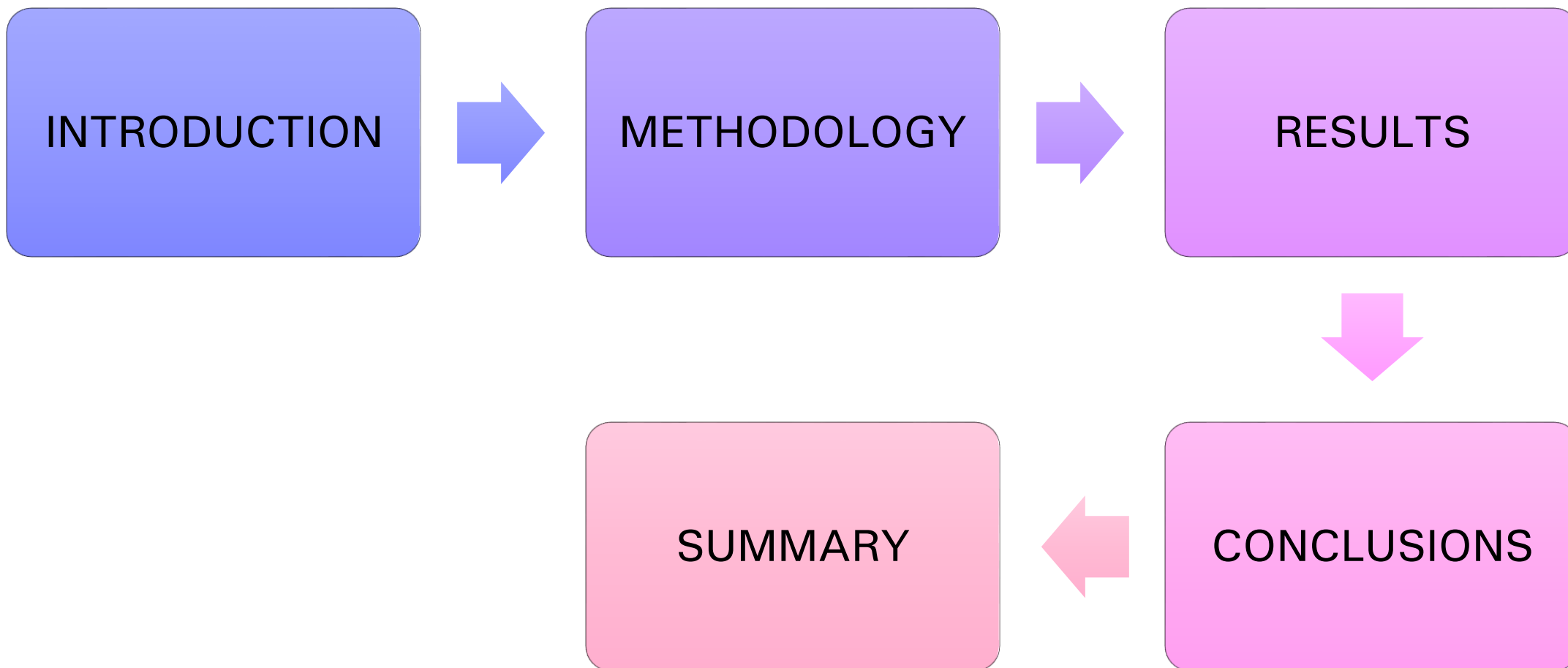# SCIENTIFIC LITERACY ANALYSIS USING VOSVIEWER: STUDY OF DIGITAL TRANSFORMATION IN PRODUCTION SECTOR AND EDUCATION
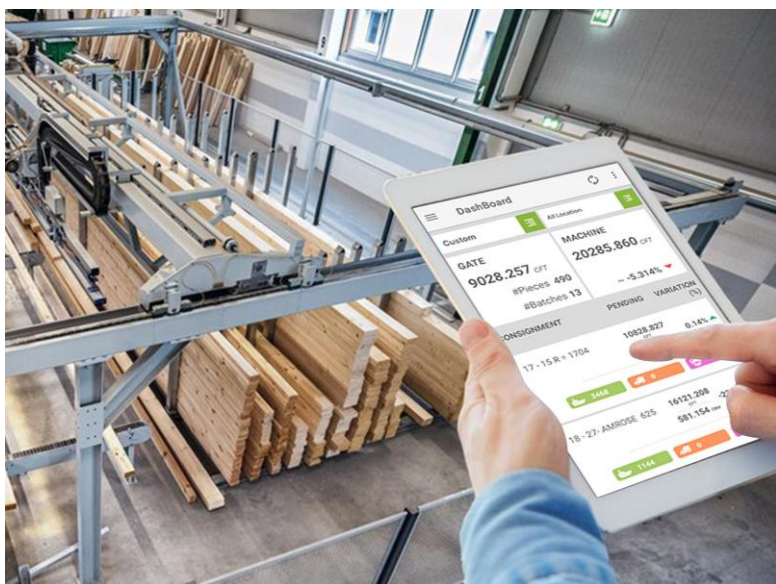
Luka Goropečnik, Matej Jošt, Leon Oblak, Anton Zupančič, Jože Kropivšek

Trnava, Slovak Republic, June 8th - 10th 2022

Allview

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AGENDA

INTRODUCTION → METHODOLOGY → RESULTS

RESULTS → CONCLUSIONS → SUMMARY

INTRODUCTION
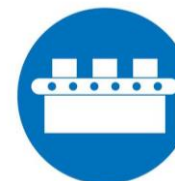
The world is facing a **new industrial** revolution, which brings more flexibility and speed, better quality and higher productivity.

If companies want to reap these benefits, they must systematically invest in **equipment**, information and communication technologies (**ICT**) and, above all, in **employee training** and **development**.

INTRODUCTION

Industry 4.0 will also significantly **change the profiles of employees and their necessary skills**, educational institutions will have to respond to this, as they will have to **offer different competences** and, above all, **change the existing concepts and methods of education** and support them with new technologies and services.
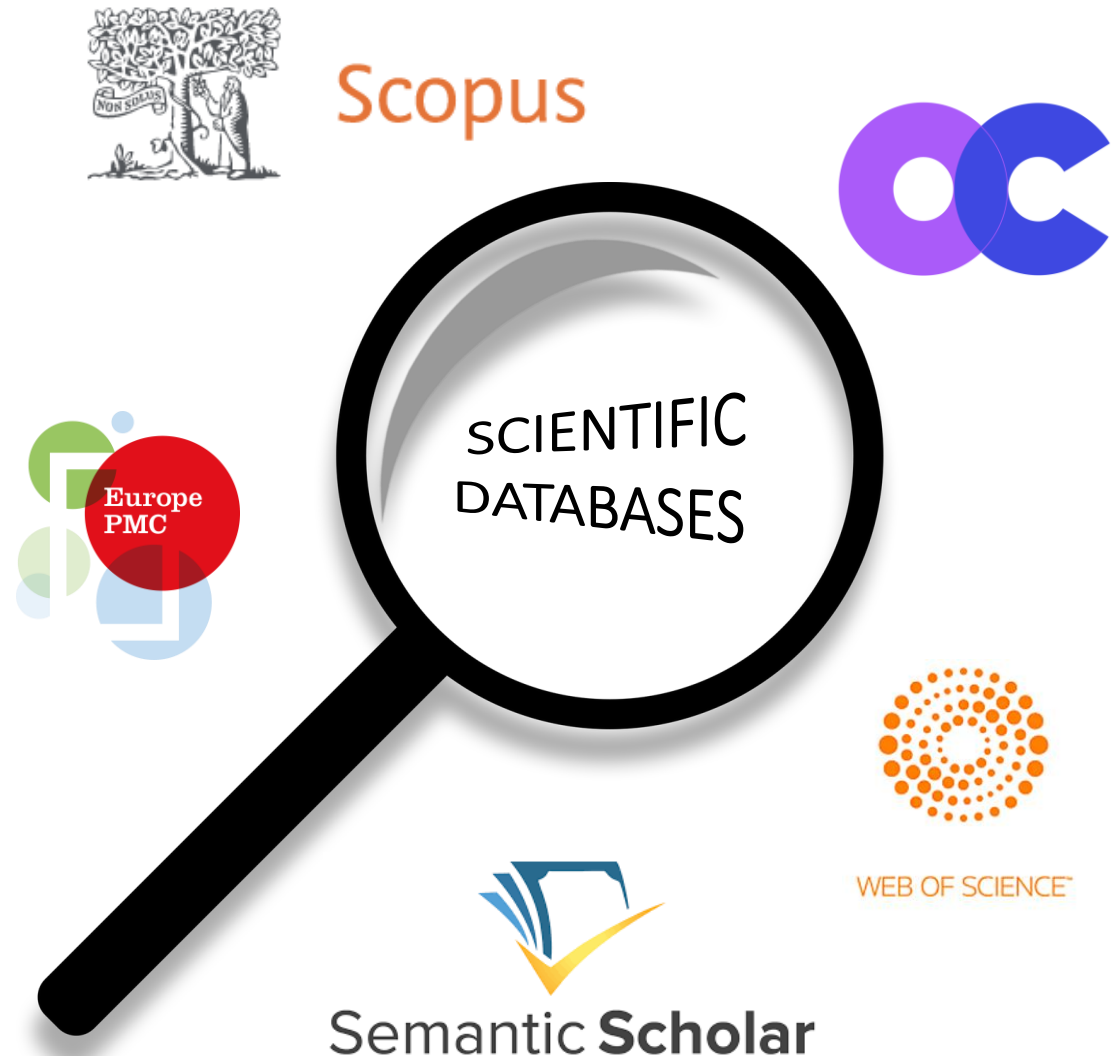
INTRODUCTION

Bibliometric methods are increasingly used to understand the structure and trends of scientific publications.

Co-occurrence analysis is bibliometric analysis method that allows understanding structure and thematic focus of scientific fields.

In recent years, several software tools have been developed that can be used for a detailed analysis of the co-occurrence of terms mentioned in publications indexed in scientific databases.

Scopus

Europe PMC

SCIENTIFIC DATABASES

WEB OF SCIENCE

Semantic Scholar

INTRODUCTION

The study aims to find out how topics related to Industry 4.0 are addressed by researchers in the context of both the education and production sector.

Item: industry 4.0 | Links: 72 | Total link strength: 360 | Occurrences: 105 | Cluster: 2

To this end, a bibliometric analysis was conducted focusing on the current literature. The analysis results of the co-occurrence of terms is a network of nodes and links, where the size of the nodes and links indicates the frequency of occurrence and the strength of the links between the nodes.
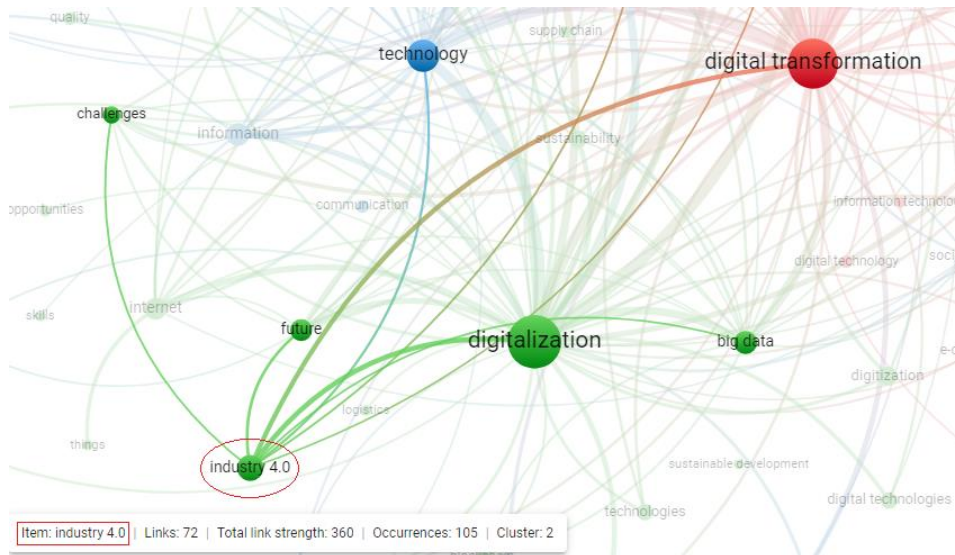
METHODOLOGY

The input data for the analysis was **bibliometric information** on peer-reviewed publications indexed in the **Web of Science**.

To gather relevant information a broad **search string** was developed:

digitalization "digital transformation" "industry 4.0"	AND	education training curricula curriculum	AND	universit* "higher education" "vocational education"	OR	(wood "wood and furniture" production AND sector) competen*
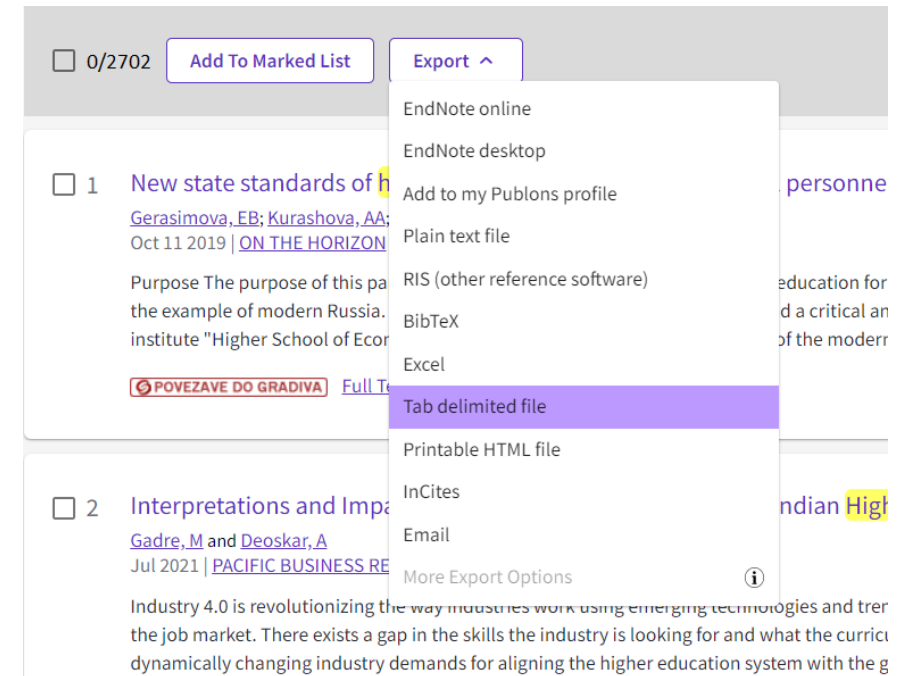
METHODOLOGY
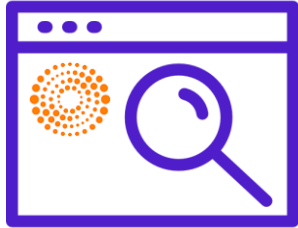
Title search returned **4.824 publications**. Study analyzed **only articles**, reducing search results to **2.702**.

The **minimum number** of **keyword occurrences** was set to **20**, which resulted in **104 unique words**.

Number of clusters was limited to **3**.

Selected	Keyword	Occurrences	Total link strength
☑	digital transformation	572	1803
☑	digitalization	652	1627
☑	innovation	283	1293
☑	technology	238	1020
☑	management	202	873
☑	performance	158	769
☑	impact	138	616
☑	big data	122	582
☑	information-technology	109	567
☑	future	110	549
☑	information	119	481
☑	strategy	98	471
☑	internet	110	451
☑	dynamic capabilities	71	427
☑	framework	78	411
☑	business	78	407
☑	industry 4.0	105	405
☑	systems	83	396
☑	model	89	365
☑	implementation	66	364

RESULTS

15,54 %

11,77 %

420 Management	**179 Economics**	**146 Green Sustainable Science Technology**	**141 Education Educational Research**
	162 Environmental Sciences		
318 Business		**141 Information Science Library Science**	**87 Engineering Industrial**
	155 Environmental Studies	**132 Computer Science Information Systems**	

The top 10 research areas of the publications resulted from our syntax on WoS.

RESULTS
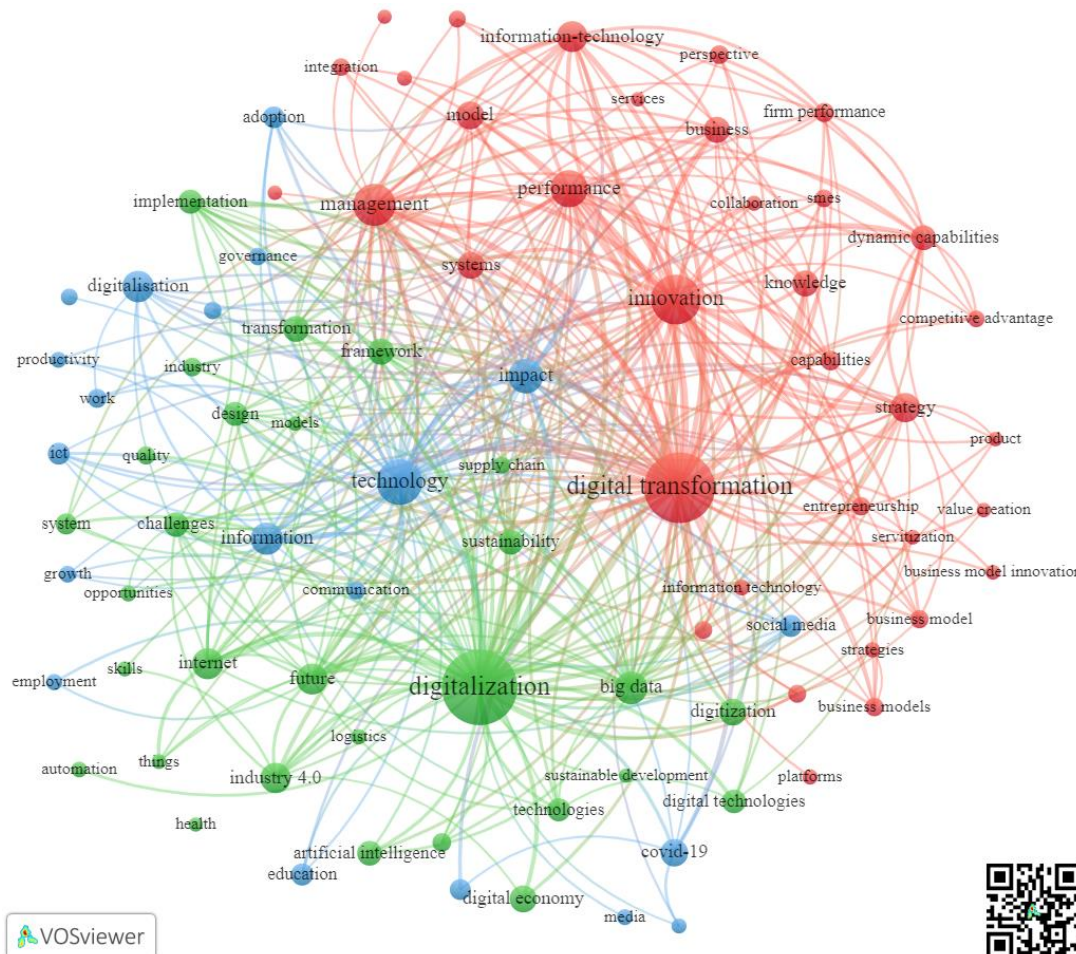
Co-occurrence analysis of terms.

The clusters are represented by different colors and consist terms that occur together most frequently.

Digital transformation, digitalization and technology seems to be appearing most frequently in each separate clusters.

In addition to our search terms, other terms also appear frequently, such as: management, performance, technology, innovation, impact, big data, industry 4.0...).

RESULTS

The most frequently used terms (colours indicate the average year of publication).

Our search syntax yielded articles published between **1922** and **2022**.

More than **80%** of articles published in the last four years and only **8%** of articles **older than 10 years**.

The most used term, digitalization, has an average of **2019.8**, while the term digital transformation has an average of **2020.3**. The main term of smallest of the three clusters (technology), has an average of **2020.0**.

Some less common and newly used terms, such as sustainability and covid-19, have appeared more recently (**last quarter of 2020**).

CONCLUSIONS

We can conclude that **digitalization** has **not been discussed much in the context of education**, as researchers have used the term **more in relation to sector**, **technology, innovation**, **performance**, and **management**.
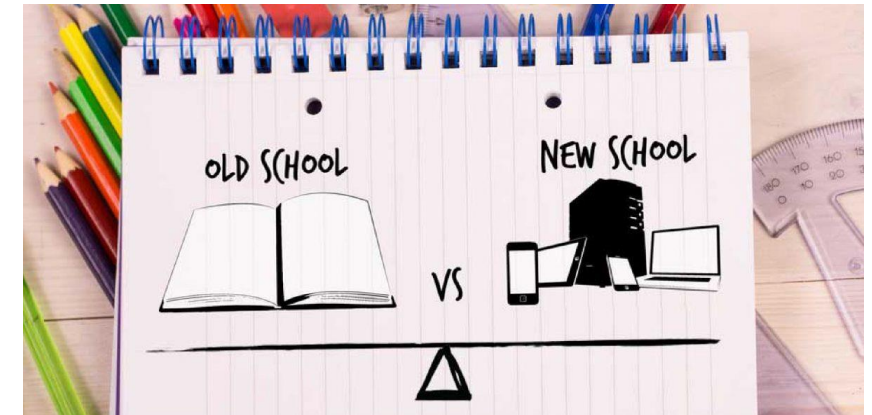
Digital transformation and **digitalization** have received much **more attention than** Industry 4.0.

Most common terms (**digitalization** and **digital transformation**) are used in **different** time periods.

CONCLUSIONS

In general, there are **many articles dealing with** the **digitalization of production sector**, which suggests that **it is also relevant to the wood and furniture industry**. This means that it is **also important for the education** and **competencies of employees**.

It seems that this **gap has also been recognised by the European Commission** (2019), as it is **funding various projects**, including educational projects related to the **wood sector**.

In particular, **Allview project**, currently underway, aims, among other things, at an **innovative approach to modernise vocational education and training in the wood sector** (Allview, 2021).

SUMMARY

With bibliometric research, we can see what directions researchers are going in, what their focus is, and identify potential gaps in the field of science.

Using **VOSviewer** software, the **co-occurance analysis** was mapped and **three clusters were defined**.

This method has some **limitations**, and every researcher should be carful and **define the parameters used precisely**.

Despite limitations, the study could be a welcome addition to the literature as **it provides an overview of certain areas associated with digitalization**. The **results** of this study **highlight** the **importance researchers place on digitalization in the context of other** targeted **topics** documented in the literature.

SUMMARY

For future studies, several more focused syntaxes could be developed to provide deeper insight into how digital transformation is being addressed in specific areas, such as the wood sector.

In addition, a comparison could be made with other current topics such as sustainability to see how researchers approach different topics.

Given the number of projects addressing this topic, an analysis of their reports would be interesting and beneficial.

THANK YOU

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