

## Research Article

# Co-ord Analysis on Soft Skills Article in Range 2016 - 2021

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**Abstract.**

Currently, education is directed to facilitate the needs of students for work skills. This supports the performance of high school graduates in their careers. So that various changes to the education system add certain skills as an achievement in learning. These supporting skills are called soft skills. Therefore, this study aims to analyze the opportunities for developing research on Soft Skills related to student work competencies in higher education. This research was conducted by analyzing article documents called bibliometric analysis. The analysis includes four stages, namely (1) determining the keywords, (2) collecting data in Scopus, (3) sending data to application and (4) analyzing the visualization. The visualization of the data displayed is only analyzed to the extent of keyword analysis. The results of the analysis show that the development of soft skills still has the opportunity to be researched. This is evidenced by the results of co-word analysis in the last five years, which still show opportunities to develop research themes related to soft skills. In the last two years in the analysis based on the year of publication, topics related to soft skills research were more oriented to the use of technology, so that further researchers could develop in that area.

**Keywords:** co-ord, analysis, soft skills

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## 1. INTRODUCTION

Education is an effort to change actions, mindsets, to have certain abilities through a transfer of knowledge [1]. The implementation of education is carried out formally or informally, such as a skills course carried out by an institution. However, besides that, most of the goals of parents directing their children to study are to make it easier to get a job [2]. In fact, a person's level of education is often a predictor of that person's work and competence in the future [3, 4], [5]. The higher a person's education level, the greater the opportunity for that person to get a job.

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The world of work faced today is not the same as the world of work before technology entered society [5, 6]. It could be that the world of work that used to only require prospective employees in the form of grades at a certain level of education. However, this is no longer the case today. The problems faced in the world of work are so complex that good communication and collaboration skills are needed [7]. For both things it is not described through the value on the diploma alone. It takes another place for someone to learn to develop these abilities.

One of the places to develop abilities that are not obtained in class is Organization. The learning process in an organization shows an increasing opportunity to transfer skills. The skills in question are skills in leadership, strategic or business management, problem solving, communication, negotiation and team work (Jose Magano, 2020). These abilities are known as soft skills.

Soft skills are not skills or abilities in the traditional sense, but are a combination of interpersonal skills and personal attributes [8, 9]. As previously described, students only learn Soft skills in the organizations they participate in. However, not all students are interested in participating in the organization at their school. So it is important for school policy makers to design learning that fosters student soft skills.

Research on soft skills development conducted by Olesya (2021) shows that there are 3 skills that can be developed through the productive method, namely communication, management and professionalism [10]. Based on this research, the tendency to develop soft skills is targeted at students. Currently, higher education institutions are increasingly expected to be involved with the challenges of the world of work [11]. Luis' research (2020) shows that doctoral program students also improve their soft skills through a learning project. Given that the core competencies that a doctor should have are soft skills themselves. This is done to prepare students to be able to quickly adapt to the world of work [12][14].

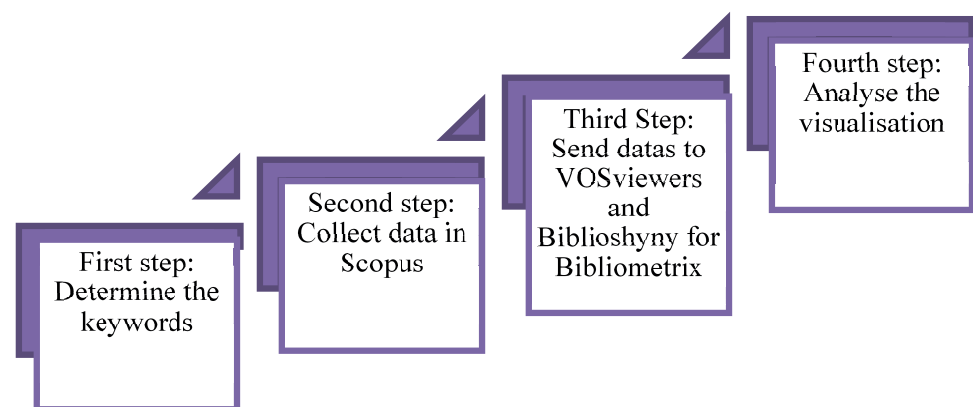
Bibliometric analysis uses citation relationships as indicators in scientific communication and tries to determine the structure and orientation of research in scientific fields by investigating them [13]. Bibliometrics allows researchers to analyze the literature on research topics to explore the conceptual structure and evolution of research themes [14]. Bibliometric methods include different techniques, such as co-citation analysis, bibliographic coupling, co-authorship analysis, and co-word analysis [15]

The purpose of this research is to see opportunities for developing research on Soft Skills. Specifically, soft skills related to student work competencies in higher education. Therefore, the bibliometric analysis carried out in this article is only limited to co-words. Co-Word analysis has been widely carried out in various fields [16–18]. However, until

now there has been no similar analysis on the topic of Soft Skills. Research on soft skills is still in the form of Systematic Literature Review research. As done by Patricia (2021), who specifically examines scientific articles in the Scopus, WoS, ERIC and PsycINFO databases to obtain soft skills tendencies that are developed in prospective teachers [19].

## 2. RESEARCH METHOD

The development of scientific fields is possible through communication between researchers. This communication can be established with a media called Scientific Journal [20]. Through the media, each researcher conducts searches related to articles that have been researched on the same topic. So that they will easily update or develop the topic. One method for analyzing published articles is bibliometric analysis. In general, this article uses the method used by Isabela (2017) and is visualized in Figure 1[21]



**Figure 1:** Research flow chart.

Before conducting the analysis, the criteria for collecting articles were determined. The researcher determines one keyword, namely “Soft skills” as the first stage. In general, the criteria used to collect articles for analysis are shown in Table 1.

In the second stage, a search was carried out based on the criteria in Table 1 and obtained as many as 426 articles with the keyword “Soft Skills” along with the year of publication from 2016 to 2021. The bibliometric data of the articles was obtained through the Scopus data base.

Furthermore, in the third stage the data base obtained was processed using Biblioshiny for Bibliometrix and VOSviewer software. The output of the two applications provides the mapping of keywords related to Soft skills and other data.

TABLE 1: Study selection approach.

No	Kriteria	Including	Excluding
1	Language used	English	Other languages, other than English
2	Period	From 2016 - 2021	Before 2016 and after 2021
3	Types of database	Scopus	Apart from Scopus
4	Keyword used	“Soft skills”	Unpublished papers, such as theses and dissertations. Does not include papers from conference proceedings

In the fourth stage, the visualization of Biblioshiny for Bibliometrix and VOSviewer was analyzed by Co-word analysis. This analysis was carried out by applying clustering and social networks to reveal the intellectual structure of the Soft skills topic. Clustering is a method where objects are grouped because of a commonality (Chen 2016). So that keywords that have a high correlation with each other have a tendency to be included in the same cluster. To facilitate the flow of discussion, this research focuses on research trends on soft skills and their relation to work skills.

## 3. RESULT AND DISCUSSION

### 3.1. Co-Word Analysis

This bibliometric analysis represents the relationship between keywords, forming a network which is indicated to appear more often in the research subject, thus allowing one to examine concepts and themes. This analysis is carried out with Biblioshiny for Bibliometrix software, which produces a visual and multidimensional representation of the data. Data visualization is made based on 50 keywords which are calculated based on the frequency of use by the author.

Figure 2 shows the keywords in the abstract that often appear in articles related to soft skills. These words show the relationship between one another. It can be said that words that have a larger size than the others are words that often appear or have a close relationship with soft skills. Co-occurrence or keyword analysis aims to see the relationship between topics. In general, the words with the largest size are the words education and employability. This means that the two words are often associated with one another. Roberto's research (2021), conducted a bibliometric analysis of articles with the keyword “career success” [22]. The results show that the co-occurrence analysis places employability and education in the same cluster and assumes that education



Figure 2: Relevant Keywords.

is able to influence the employability and professional development of graduates. However, in this article, the two words are analyzed separately.

The word “education”, can be interpreted that education is a vehicle for training soft skills. Research by Federica Emanuel (2021) designed an interactive online learning that trains 12 soft skills for students [23]. This learning includes interactive videos, case studies and self-assessment and project assessments. In the end, students will receive a certificate that shows the value of the 12 soft skills trained. Similarly, Cornalli (2018) agrees that changes in production systems and the labor market have placed higher education in place to train job-ready graduates [24]. In order to achieve this goal, universities do not only transfer knowledge, but must develop soft skills that students can apply to situations and work areas.

In this regard, the word that has the next large size is the word “Employability” or work skills. Job skills are personal attributes that enable people to get jobs and support career life more easily [25]. The link between these words and soft skills is very clear, where to have good employability, one must have adequate soft skills as well. Employability for each field is different. Employability skills required in the field of engineering, differ in the fields of business, teacher training and others.

Engineering is a discipline that deals with the acquisition and application of scientific methodologies and knowledge of mathematical logic to develop and innovate the use of materials, machines, structures, systems and processes for specific purposes [26]. For example, in Malar’s research (2021) mapping the employability skills that engineers should have [9]. As many as 25 types of soft skills that should be possessed, some of which are as follows: the ability to work under pressure, the ability to plan strategically, the ability to solve complex problems, the ability to focus and others. It could be that

these abilities are owned by other professions, but for a technician, at least these abilities are the basis for screening the workforce.

In contrast to previous research, Hadromi (2020) also describes the employability skills that teachers should have [27]. There are 3 employability skills related to soft skills, namely skills in the workplace, effective relationships that are evenly distributed and applied knowledge related to their field of knowledge. Meanwhile, Mersiha (2021) suggests soft skills that should be possessed by workers in the business field, namely teamwork, positive attitudes, and interpersonal skills [28]

Other words that become keywords are active learning, 21st century skills, life long learning and others. These words are interconnected with the entry of the 21st century era. Of course, skills are needed that are not the same as before or before technology entered society [29, 30]. Therefore, to fulfill this, 21st century skills are needed which are currently being trained in learning [31].

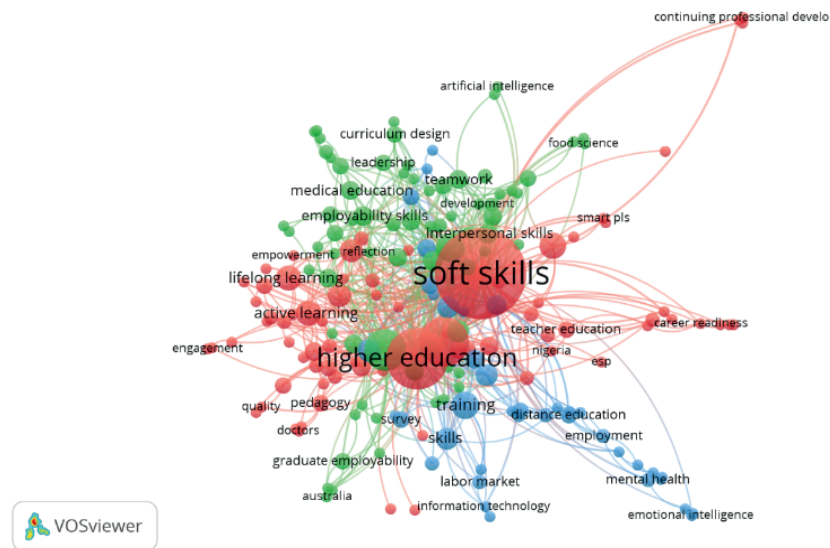
Various methods and strategies are presented to teach these 21st century skills, one of which is active learning [32]. This learning activity places students as the main actors, usually in the form of project based or problem based [33]. If students are used to this way of learning, then those ways will become a habit that will always be applied.

This Co-occurrence analysis really helps researchers to see gaps in designing a study. With the collection of keywords that are often used by the authors of previous articles, further researchers can create new topics, where the main keywords have not been found or develop an existing keyword by making various innovations

### 3.2. Clustering Analysis

The next analysis is Co-word analysis based on clusters. Just like Figure 2, Figure 3 also contains some keywords. However, in Figure 3 the words are grouped into 3 clusters which are marked with different colors. The grouping is done to see the tendency of these words to be used together in an article. Based on Figure 3, there are three word clusters represented in three colors, namely red, green, and blue.

The first cluster is the red cluster. This cluster contains words such as soft skills, higher education, teacher education, pedagogy, active learning etc. These words illustrate that articles using these keywords focus on developing soft skills in the higher education area. As well as how to teach or train these soft skills through pedagogical activities that make students actively learn. Keow's research (2019) contains keywords in the form of soft skills and higher education [34]. The content of the research is to analyze how lecturers transfer soft skills to students through instructional activities. This research is



**Figure 3:** Keywords Based on Cluster.

quite unique by involving lecturers as the object of research, because usually research like this only focuses on students.

The second cluster is the cluster in blue. This cluster consists of keywords such as training, labor market, employment, depression, emotional intelligence, skills etc. It can be concluded that these keywords contain factors that affect a person's soft skills. These factors consist of external factors such as training, labor market and employment. While the keywords that indicate internal factors are depression and emotional intelligence. Bhuvanewari's research (2021) includes the keyword emotional intelligence, where the content of the research analyzes student behavior in communicating in the digital world [35]. In this study, emotional intelligence was assessed as having an effect on students' soft skills and time management. When it comes to employability, emotional intelligence is also used in articles written by Gopika [36]. The research emphasizes the types of soft skills recognized by business schools in Delhi and the pedagogical techniques used to provide soft skills training by developing emotional intelligence. Based on the description, it is very good to develop soft skills followed by emotional intelligence, where emotional intelligence is part of soft skills that are sometimes not realized [37].

The third cluster is a cluster with a green color. There are several keywords that are incorporated in this cluster, namely curriculum design, active teaching, leadership, teamwork, employability skills, problem solving etc. These words show a tendency to two things, namely education and soft skills being developed. Education is represented by the words curriculum design and active teaching. This means that the current curriculum design has accommodated the development of college students' soft skills.

And the soft skills developed are shown by the words teamwork, leadership and problem solving. All of these skills can be honed through active learning such as problem-based learning, projects and others.

### Time line Analysis

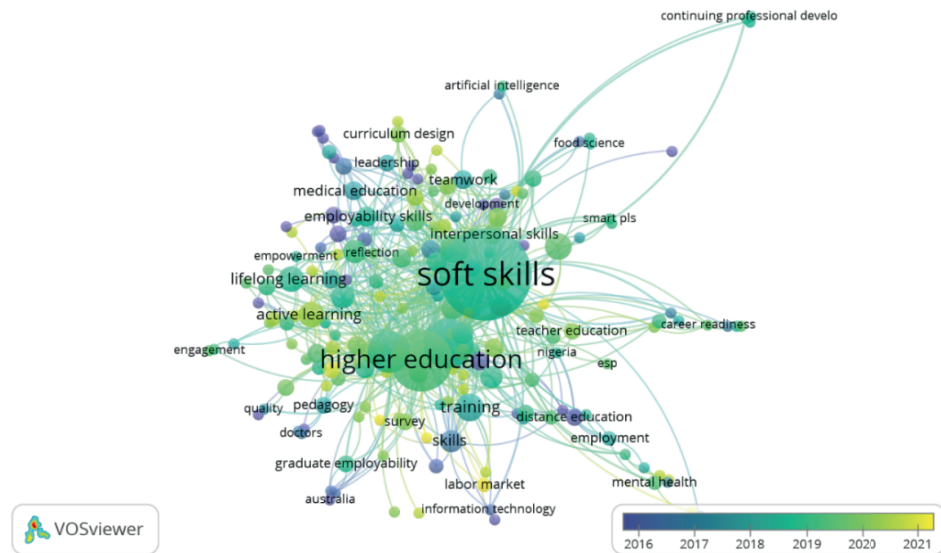


Figure 4: Keywords based on time line.

### 3.3. Time line Analysis

The next analysis is about the novelty of topics related to soft skills. Previously, the grouping of topics based on their tendency to a general theme, then in Figure 4 the visualization of VOSviewers shows the novelty side. The scale shown in Figure 4 provides information on the range of years from 2016 to 2021. The scale also provides information related to color. The lighter the color behind each topic, the more recently the topic has been discussed in journal articles.

The darkest areas represent 2016 and 2017. In that year the topics being discussed were skills, quality, doctors, employability skills, career readiness. It cannot be said that these words are pioneers of research related to soft skills, because research on soft skills already existed before 2016. However, this information provides an overview of the topics that are being researched at that time. Based on these keywords, research on soft skills is considered to be closely related to the quality of graduates and affects their competence and readiness for work (career readiness).

Furthermore, in the third and fourth years, 2018 and 2019, slightly contrasting colors have begun to appear. This year the word soft skills has begun to represent the



research topic along with other keywords, namely higher education, teacher education, engagement and long life learning. At this time, soft skills are no longer discussed in general and have been separated from hard skills. Based on other keywords, it can be assumed that higher education is starting to become the object of soft skills development, especially universities that produce teacher candidates.

In the fifth and sixth years, it looks more contrasting than before, namely 2020 and 2021. The keywords studied in this period are labor market, information and technology. If seen in Figure 4, the research topics at that time tended to be few. It is possible that research on soft skills in general is no longer in demand, but tends to follow the competencies demanded by the job market.

## 4. CONCLUSION

Based on the results of the co-word analysis, it can be concluded that the development of soft skills still has the opportunity to be researched. This is evidenced by the results of co-word analysis in the last five years which still show opportunities to develop research themes related to soft skills. In the last two years in the analysis based on the year of publication, topics related to soft skills research were more oriented to the use of technology, so that further researchers could develop in that area.

In addition, most of what affects the development of soft skills is the demand for work competencies which currently require skills that are not only in the form of ordinary work skills, but soft skills that are integrated with 21st century skills.

Recommendations for research related to soft skills is to utilize technology and one's intrapersonal abilities. The combination of these two things can become a new framework for developing soft skills research topics. For example, "Technological Habits of Mind" which combines technological abilities with one type of soft skill, namely the habit of thinking in solving problems

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