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## A bibliometric analysis of research on principal leadership and student achievement

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### Abstract

This study aims to explore the bibliometric review of research on principal leadership and student achievement. The study consists of 473 articles indexed in the Web of Science database between 1992 and August 2019. This database provides access to bibliographic data of publications. Data were analysed by using VOSviewer software to create co-authorship, keyword and citation map. Descriptive statistics and social network analysis were used for data analysis. There are 93 items that are mentioned at least four times in 473 articles. These keywords grouped into nine clusters. The most common keywords are achievement, school leadership, principal, school improvement, instructional leadership, teachers and performance. The temporal analysis finds that recent interest revolves around teacher evaluation, teacher professional development, trust and collaboration. Researchers can do a similar study in the field of school leadership and school culture.

**Keywords:** School principal, academic achievement, bibliometric analysis.

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## 1. Introduction

The relationship between the principals' leadership behaviours and student achievement has been investigated for over 50 years. Especially, recent policies on accountability have increased the interest in studies investigating this relationship. Previous studies showed that school principals' leadership behaviours have a pivotal role in improving student achievement (Hallinger, 2018; Leithwood & Seashore Louis, 2012; Ozdemir, 2019; Ozdemir & Yalcin, 2019; Sebastian, Huang & Allensworth, 2017). Most studies have focused on instructional leadership and transformational leadership. These studies were mostly conducted in the USA, England, Austria and China. In addition, one of the problems faced by synthesis studies carried out in the last 50 years is the focus on limited leadership behaviours in examining student achievement. In recent years, researchers have examined the impact of distributed leadership and shared leadership behaviours on students' academic achievement.

Studies examining the indirect relationships between principal leadership and student achievement focused on the mediator effect of teachers. For example, Hoy (2012), in his literature review, found that the variables of collective effectiveness, collective responsibility, collective and relational trust, professional community, school collaboration with parents, academic pressure and focus were highly correlated with academic achievement. The common result of the studies is that the school principal has a small and indirect effect on student achievement through teachers. Researchers have reviewed the studies conducted on the relationship between school principals and student achievement, such as meta-analysis (Robinson, Lloyd & Rowe, 2008) and synthesis (Leithwood, Louis, Anderson & Wahlstrom, 2004). In the conclusion part of this research, it is stated that educational leadership has important implications for effective schools.

Principals can act to create high expectations among teachers to achieve school goals, conduct the evaluation process to provide useful feedback to teachers and coordinate the curriculum to emphasise the basic skills of the students. This evidence has led to increased interest in how to better develop effective school leaders. However, there is little study on bibliometric analysis to determine the scientific communication of the researchers. This study aims to explore the bibliometric review of research on principal leadership and student achievement. Additionally, it is aimed to reveal the scientific communication of the researchers, the active publications and the interactions that occur in the context of the author and the publication. In this research, the following questions were answered:

1. What is the relatedness of keywords based on the number of studies in which they publish together?
2. What are the keywords occurring in recent (after 2016) publications?
3. What is the relatedness of studies that are cited together?

## 2. Method

In this study, bibliometric methods, which are a quantitative approach, are used. It is aimed to measure scientific communication in a discipline with these methods (Pritchard, 1969). It is a method used to reveal the scientific thinking structure of the studies (Ding, 2011). The Web of Science (WoS) database was used for this study. The most important reason for using this database is that it provides scientifically consistent and valid information (Shibata, Kajikawa, Takeda & Matsushima, 2009).

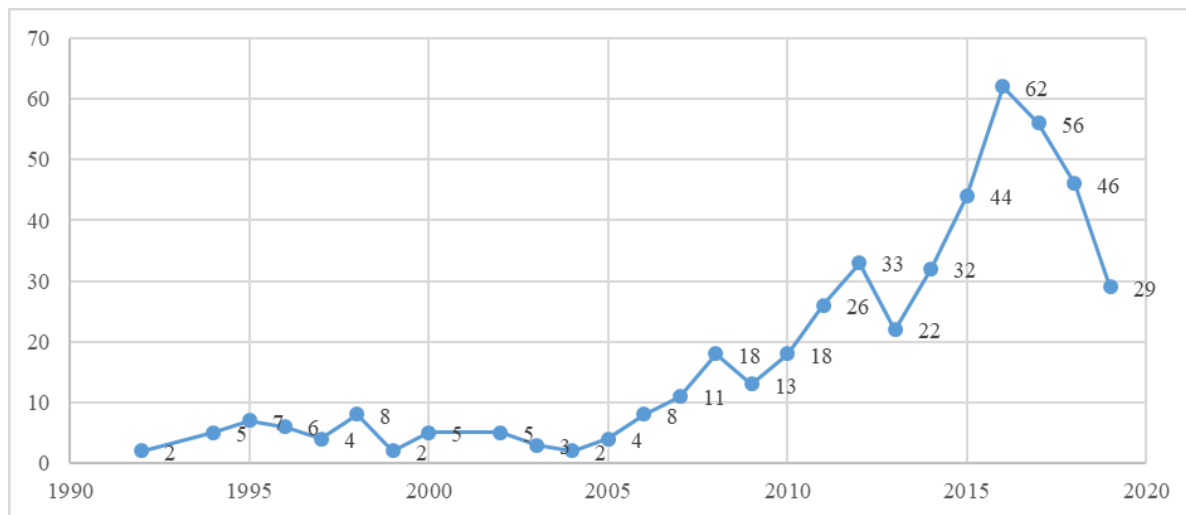
### 2.1. Procedures

In this study, data scanning strategies used in bibliometric studies in the past were examined in order to form the keywords to be used (Gumus, Bellibas, Gumus & Hallinger, 2019; Hallinger & Kovacevic, 2019). The WoS database was searched for the years 1975–2019 using the keywords 'school principal', 'academic achievement' (Box 1).

### Box 1. Basic search on WoS

TOPIC: (school principal) AND TOPIC: (academic achievement)  
Timespan: All years. Indexes: SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI.

The study consists of 473 articles indexed in the WoS database between 1992 and August 2019. This database provides access to bibliographic data of publications. Lexical Search Strategy was used for selecting articles. The keywords ‘achievement’ and ‘principal’ were used to search the articles published in the 41 journals. Figure 1 shows the number of publications by years.



**Figure 1. Number of publications by years**

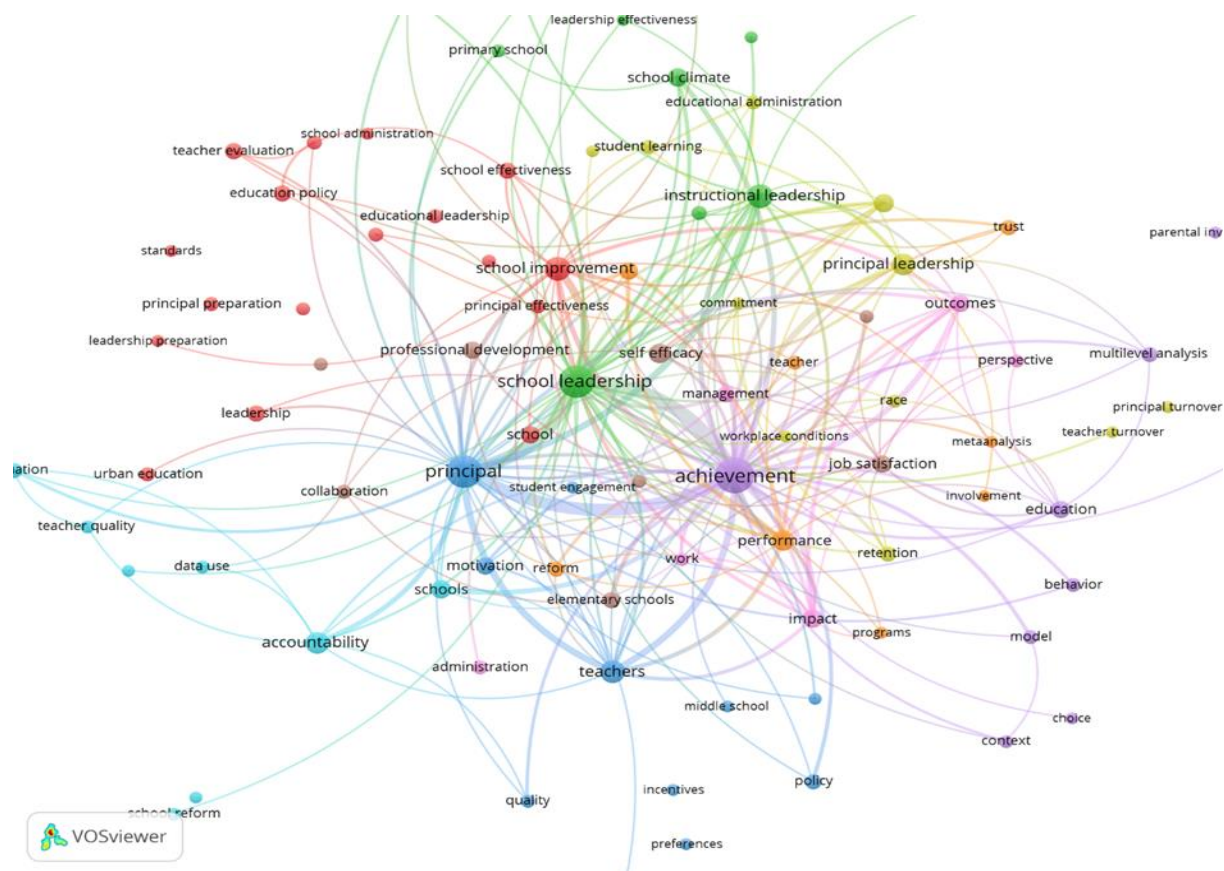
Figure 1 indicates that the research findings showed an increase in the number of articles over the years. Especially after 2005, there was an upward momentum in the number of publications. Most publications were made in 2016.

### 2.2. Analysis

Data were analysed by using VOSviewer software to create co-authorship, keyword and citation map. Descriptive statistics and social network analysis were used for data analysis (Zupic & Cater, 2015). First, co-occurrence analyses were made to determine the relatedness of keywords based on the number of studies in which they publish together. That means that those words are closely related. Keywords consist of at least three words provided by the author of a publication. Second, overlay visualisation was conducted to determine the average publication year. Keywords occurring in recent publications are coloured yellow. Third, co-citation analysis was conducted to examine the relatedness of studies that are cited together.

### 3. Findings

In this study, firstly, co-occurrence analyses were made to determine the relatedness of keywords.

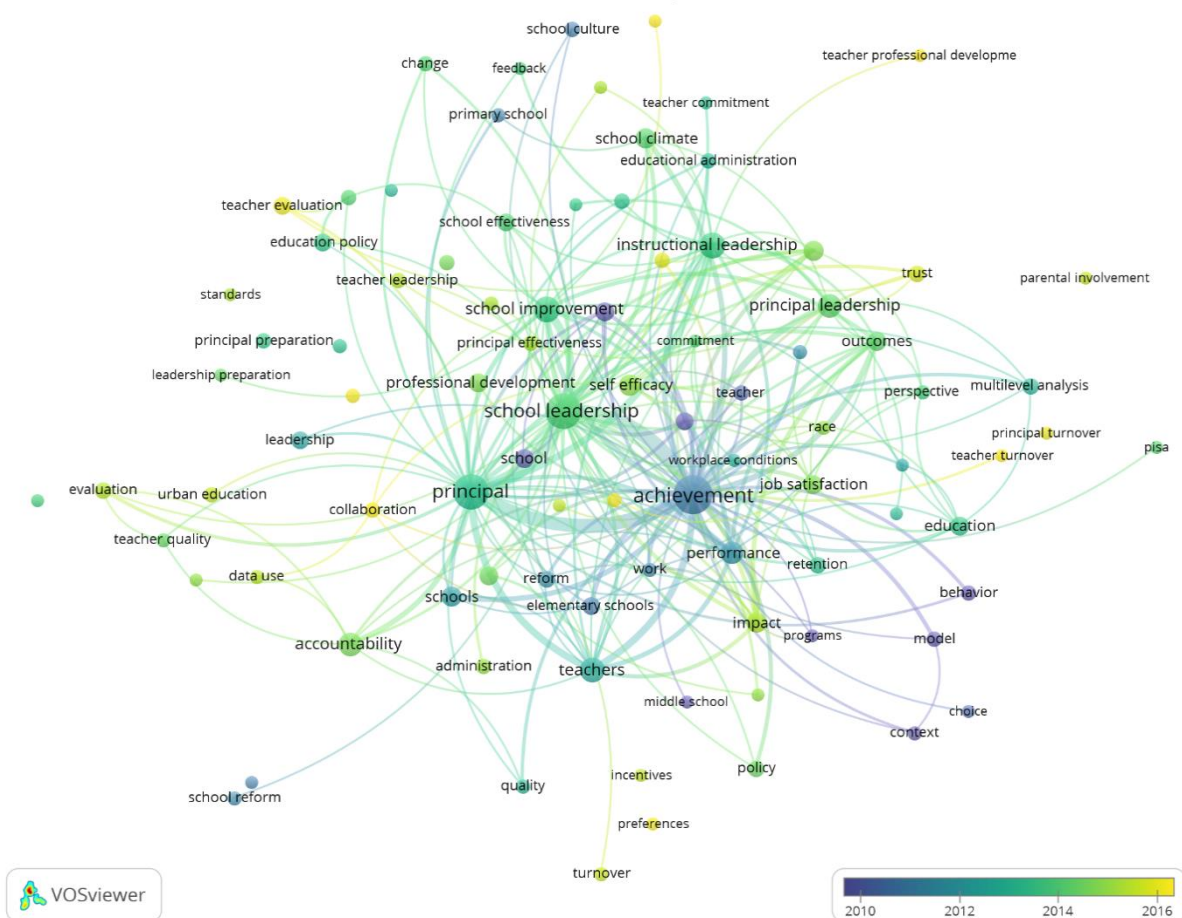


**Figure 2 shows the relatedness of keywords.**

**Figure 2. Keyword co-occurrence map based on 473 articles published from 1992 to 2019**

In Figure 2, there are 93 items that are mentioned at least four times in 473 articles. These keywords grouped into nine clusters. The most common keywords are achievement (113 times), school leadership (90 times), principal (88 times), school improvement (32 times), instructional leadership (32 times), teachers (28 times) and performance (21 times).

The first cluster (red) of keywords is associated with school improvement that consists of school effectiveness, principal effectiveness, principal preparation, teacher effectiveness, teacher evaluation, teacher leadership, education policy, diversity and standards. The second cluster (green) of keywords is associated with school leadership that consists of feedback, instructional leadership, transformational leadership, teacher professional development, school climate and school culture. The third cluster (blue) consists of 12 items that are motivation, quality, student engagement, middle school and turnover. The fourth cluster (yellow) consists of commitment, distributed leadership, race, retention, student learning and workplace conditions. Figure 3 shows the overlay visualisation for the keywords.



**Figure 3. Overlay visualisation for the keyword co-occurrence map**

According to Figure 3, keywords occurring in recent publications are coloured yellow. Recent interest revolves around 'teacher evaluation', 'teacher professional development', 'trust', 'collaboration', 'principal turnover', 'teacher turnover'.

Figure 4 shows the coloured clusters of the co-citation network. This analysis reveals the relatedness of items that are cited together. According to Figure 4, the green cluster emphasises especially studies of leadership for learning (e.g., instructional leadership and transformational leadership). Yellow cluster determines especially studies of leading school culture and climate (e.g., collective teacher efficacy and teacher self-efficacy). The red cluster shows the studies of distributed and shared leadership. Blue cluster shows the studies of leading teachers (e.g., teacher evaluation, teacher quality and teacher leadership).

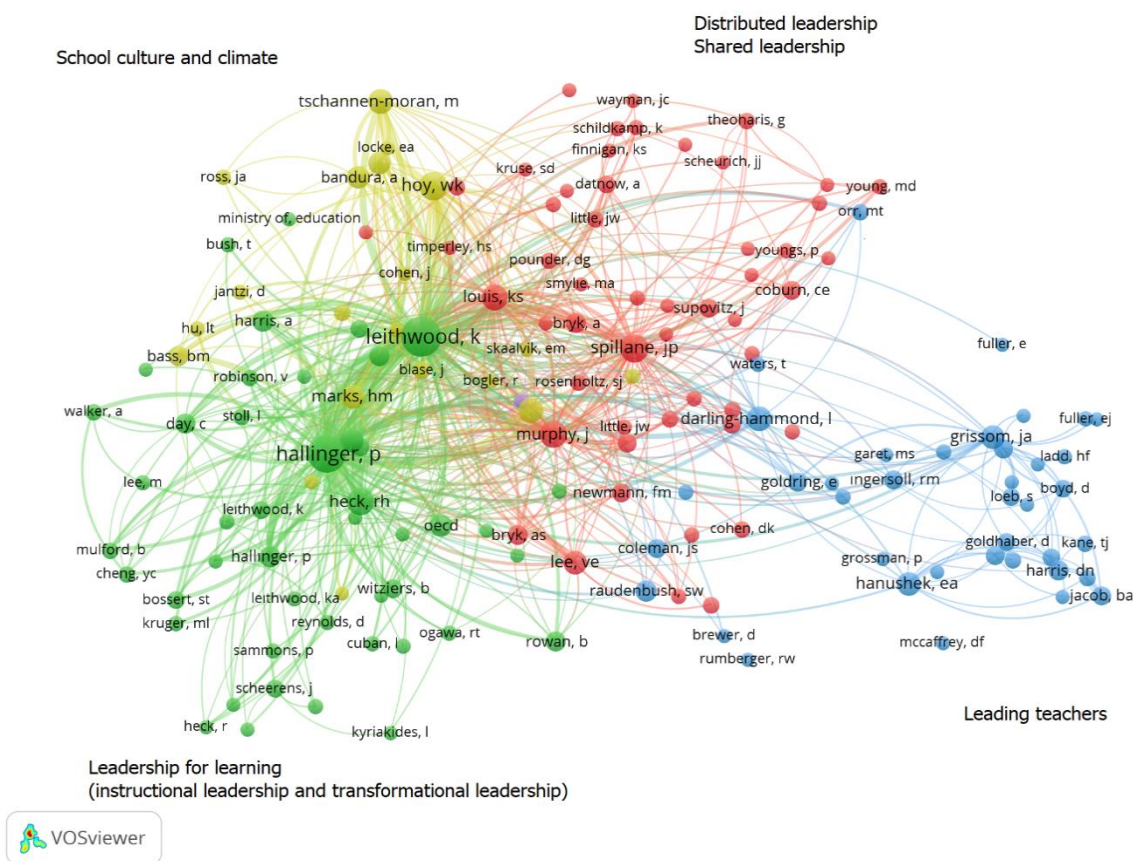


Figure 4. Author co-citation network

#### 4. Discussion

The purpose of this study was to examine the bibliometric review of research on principal leadership and student achievement. The study finds that the most common keywords are achievement, school leadership, principal, school improvement, instructional leadership, teachers and performance. This situation reveals the structure of the literature examining the relationship between the school principal and student achievement. Previous studies show that principals’ instructional leadership behaviours have a critical role in student achievement (Hallinger, 2011; Ozdemir & Yalcin, 2019). Especially after 2005, there was an upward momentum in the number of publications. Accountability policies also led to an increase in the number of these studies (Hallinger, 2018). Another finding of this study indicates that recent interest revolves around teacher evaluation, teacher professional development, trust, collaboration, principal turnover and teacher turnover. Recently, many countries have introduced new reforms for teacher evaluation. These reforms may lead the studies to focus on teacher evaluation and professional development (Kraft & Gilmour, 2016; Lochmiller, 2016). These two keywords are core components in instructional leadership theory. The results of the co-citation network analysis show that the studies cited together are about instructional leadership theory and transformational leadership theory. This finding is similar to the study conducted by Robinson et al. (2008). They found that most studies in the field have focused on instructional leadership and transformational leadership. Additionally, a cluster in this study shows that researchers took up the studies not only of these leadership behaviours but also distributed and shared leadership theories were investigated (Spillane & Healey, 2010). One of the limitations of this

study is that the data are only downloaded from the WoS database. Therefore, all works of literature have not been evaluated. Scopus database can be used for future research. Additionally, researchers can do a similar study in the field of school leadership and school culture.

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