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# Comprehensive Researcher Evaluation Model: Lessons from the world

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## Abstract

Purpose: This study aims to reconstruct researcher evaluation metrics by synthesizing global scientific literature and proposing a Comprehensive Researcher Evaluation Model (CREM). The objective is to provide a more holistic framework for assessing researchers' commitment, capabilities, and contributions beyond traditional evaluation measures.

Methodology: The research employs a meta-synthesis approach, analyzing 111 international scientific sources. By reviewing and integrating lessons from global experiences, the study identifies key principles and criteria for developing a comprehensive researcher evaluation framework.

Findings: The findings highlight the limitations and risks of relying solely on traditional metrics, such as citation counts, for evaluating researchers. The study introduces restorative metrics that provide a more balanced and comprehensive assessment of scholarly performance. It proposes a five-level evaluation model based on four dimensions: Attitudinal, Insightful, Behavioral, and Institutional. The results emphasize that research performance emerges from the interaction between individual characteristics and the surrounding research ecosystem, and therefore should be assessed by knowledgeable peers within the relevant context.

Conclusion: The study concludes that effective researcher evaluation should move beyond conventional quantitative indicators and adopt a multidimensional perspective. Academic work is considered truly valuable when it contributes to theoretical advancement or economic development in the medium term and promotes social welfare and global progress in the long term. The proposed CREM framework offers a more comprehensive and context-sensitive approach to evaluating researchers and their impact.

**Keywords:** Researcher Evaluation Model, Scientometrics, Altmetric, Research Ecosystem, Multi-dimensional Assessment

## Introduction

Evaluating researchers' achievements and the cultural impact of their work is a crucial mechanism for research funding, as well as for decisions regarding promotion and tenure. Historically, researchers were ranked through expert peer reviews, focusing on the quantity and quality of their output. In recent decades, however, this assessment has shifted towards examining citation metrics.

This approach, considering the emphasis placed on publication volume, quality, venue, and the flow of impact, requires critical scrutiny. Significant questions arise regarding this transition: To what extent does human evaluation, based on these criteria, serve as a useful mechanism for conducting such complex assessments in a consistent and equitable manner (Ibrahim N, 2015) (Franco Aixelá, 2015) (Belter, 2015). Criticisms leveled against this form of evaluation include a tendency toward bias, inconsistency among reviewers, nepotism, groupthink, and individual subjectivity ( Frixione, 2016) (Marzolla, 2016) (Marsh, 2008) (Kaatz, 2015).

To mitigate these limitations, new approaches have been introduced that rely less on individual critiques and more on scientific and objective metrics (Aoun, 2013) (Hicks, 2015) (King, 1987). Success metrics focus on one or a combination of four dimensions: Quantity of researcher outputs (Productivity), Value of outputs (Quality), Achievements of research outputs (Impact), Relationships between publications or authors and the wider world (Influence) (Abramo, 2012) (Arimoto, 2015) (Carey, 2016) (Durieux, 2010) (Selvarajoo, 2015). The online publication of articles in journals facilitates easy access to citations. Furthermore, it provides access to usage statistics—such as the number of article downloads—thereby establishing a new set of metrics to compare researchers, journals, and articles. This, in turn, enables the evaluation and assessment of the relative worth of research collaborations (Durieux, 2010). Based on online and periodic impact measurements—such as the number of downloads or the frequency of social media (Wildgaard, 2014) mentions—relatively new metrics have emerged. These are based on citations, publication counts, or altmetrics (Maximin, Practice corner: the science and art of measuring the impact of an article, 116-118), and are collectively referred to as bibliometrics (Wildgaard, 2014).

The h-index and Journal Impact Factor (JIF) are the most established benchmarks for referencing researchers' success. The JIF measures the average number of citations per article in a journal over the previous year; therefore, it is considered a good indicator of journal quality. However, it is increasingly being utilized as a primary quality metric for individual researchers (Callaway, 2016). The h-index, introduced by Hirsch in 2005, attempts to capture both the productivity and the impact of a researcher in a single data point. The h-index is defined as the number (*h*) of papers published by a researcher that have each been cited at least *h* times. The use of the h-index has become widespread, as evidenced by its integration into author profiles within databases such as Google Scholar and Scopus.

Furthermore, the advent of online databases has led to a proliferation of alternative evaluation models and metrics, many of which seek to improve upon existing approaches (Bollen, 2017). These models and metrics include approaches that assess the impact of articles by tracking variables such as the number of online downloads or views, changes in activity surrounding specific research, utilization by the scientific community, or mentions in social media.

Citation-based methods possess serious shortcomings in determining research capability, which are often overlooked. This deficiency harms the scientific institution to such an extent that there is serious doubt regarding whether these methods can fulfill the institution's ideals. In this research, we intend to introduce dimensions that may partially mitigate or compensate for this deficiency, while also providing warnings regarding the dysfunctions of traditional citation-based methods. Subsequently, building upon modern evaluation approaches, a comprehensive model for evaluating researchers will be established.

Therefore, the **research questions** are as follows:

1. What are the limitations of traditional measurement?
2. What are the risks of relying exclusively on traditional evaluation methods?
3. What lessons can be derived from modern evaluation approaches?
4. What are the components of a comprehensive model for researcher evaluation?

## 1. Theoretical Framework

### 1.1. Approaches Focused on Scientific Citation Production (Traditional Approach)

**Focus on the H-index:** The H-index is among the most frequently discussed metrics in the research literature, with 254 articles examining it. In many of these articles, authors consider its use more prudent than merely counting citations and publications, viewing it as a direct, logical, and accurate metric (Franceschini, 2012)( Saad, 2010). Authors have noted that combining it with publication productivity and citation impact indices is more reliable (Duffy, 2011)( Prathap, 2012) and more stable (Agarwal, 2016) than the average citations per publication, as it is not skewed by a single common (highly-cited) article (Saad, 2010).

Furthermore, the H-index exhibits appropriate convergent validity (Saad, 2010) and serves as a robust predictor of future success (Agarwal, 2016).

Nevertheless, due to the time-lag effect on citations and publications, the H-index increases with a researcher's annual activity in the scientific field and cannot decrease even if their productivity later declines (Pepe, 2012). Consequently, numerous authors have stated that this index is unsuitable for comparing researchers at different career stages (Haslam, 2009) or for evaluating early-career individuals (Trueger, The altmetric score: a new measure for article-level dissemination and impact, 2015). The H-index is also sensitive to criticisms such as the potential for "gaming" (strategic manipulation) and its inability to reflect varying levels of co-author contributions (Ioannidis, 2016). Moreover, citation patterns vary across different fields (Van

Leeuwen, 2008) and medical sub-specialties (Kshettry, 2013). Some argue that the H-index should not be utilized as the sole measure of a researcher's success (Kshettry, 2013).

**Modified H-index:** Several modified versions of the H-index have been investigated. These versions attempt to overcome existing limitations by describing the core strengths of balanced production alongside its impact. For instance, the G-index measures global citation performance (Biswal, 2013); it is defined similarly to the H-index but assigns greater weight to articles receiving higher citation counts. Azer and Azer (2016) stated that this index is a more useful scale for researcher productivity (Tschudy, 2016). Another variant is the M-quotient, which accounts for the time since the first publication, thereby reducing the bias against late-stage students (Joshi, 2014) (Danielson, 2013). Other H-index variants reported in the literature have attempted to examine articles by other authors, such as the h-maj index, which only includes articles where the researcher played a primary role, or weights contributions based on author order (Biswal, 2013) (Ion, 2017).

### 1.2. Approaches Focused on Research Supplements or Altmetrics (Modern Approach)

The idea of impact measuring has moved beyond citation analysis and was proposed long before the emergence of social media (Haustein S & 1145-63, 2014). Rapid changes in the way research is published have not only challenged existing research impact measurement models but have also brought about questions regarding current methods (Hammarfelt, 2014). Now, altmetrics—indicators based on activity in social media environments—have emerged as an alternative for measuring scientific impact (Haustein S & 1145-63, 2014).

Several definitions of altmetrics have been proposed, a few of which are mentioned here:

1. Altmetrics is a growing movement that seeks to evaluate scientific impact using new methods based on data extracted from the social web. Altmetrics is proposed to support faster, broader, and more diverse measures of scientific impact (Bar-Ilan, 2013).
2. Altmetrics is an approach for revealing the "invisible effects" of research impact by examining activities in online systems and tools (Cronin B, 2014).
3. Altmetrics provides a complete picture of how conversations, thoughts, and behaviors are influenced by research products (Altmetrics, 2013).

## 2. Research Methodology

The present study is developmental-applied in terms of its objective, qualitative in nature regarding the data, and utilizes documentary information as the data collection method (Habibpour & Safari, 2011). The research approach is analytical-descriptive, and qualitative data are gathered through the Meta-Synthesis qualitative research method. The meta-synthesis approach is a type of qualitative study that examines information and findings extracted from other qualitative studies with similar and related topics (Habibpour & Safari, 2011). Consequently, the sample for the meta-synthesis is constructed from selected qualitative studies based on their relevance to the research question (Lindgreen, Vanhamme and Palmer, 2004: 647-680). In this study, the meta-synthesis method has been used to compare, interpret, transform, and combine various frameworks and models presented in the field of metrics used in the evaluation of research and researchers. To this

end, all academic database websites, including Web of Science Core Collection, MEDLINE, and BIOSIS Citation Index, were reviewed using keywords related to researcher success. The aforementioned scientific databases were searched with the following keywords, and the results formed the basis of the current research: In the first stage, only the phrases: researcher excellence, track record, researcher funding, relative to opportunity, researcher potential, research researcher perform, career pathway, academic career pathway, funding system, funding body, researcher impact, scientific productivity, academic productivity, top researcher, researcher ranking, grant application, researcher output, h-index, impact factor, individual researcher and approaches to its assessment model were examined, and subsequently, various combinations of the terms: framework, assess, evaluat, metric, measur, criteri, citation, unconscious bias, rank were added.

The following inclusion criteria were utilized: (1) Persian or English language, (2) published within the last 10 years, (3) availability of the full text, and (4) the condition that the study must discuss at least one approach for evaluating the success of a specific researcher.

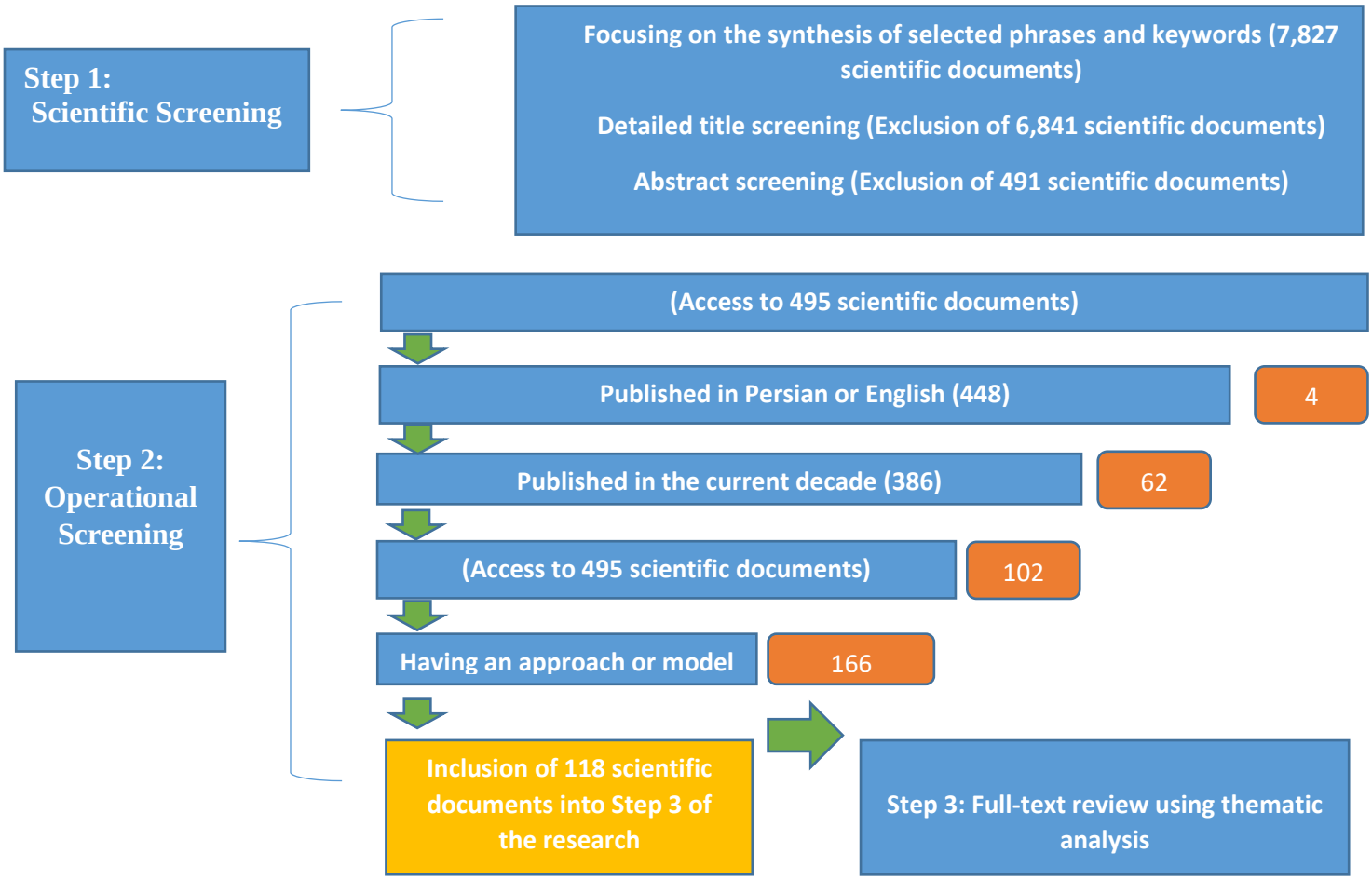



*Figure 1:The path to selecting scientific documents in research*

## 3.Findings

After reviewing and coding the selected articles, it was found that 40 articles (33.8%) discussed and examined the application of publication counts and citations for the purpose of evaluating a researcher's success. The h-index (Stallings, 2013) indicates both the number of publications and the impact (utility) of a researcher's work (Durieux, 2010) (Kreiman,2011). Some studies have aligned the validity of citation and publication counts with other indicators of scholarly success, such as peer recognition and rewards (Halvorson, 2016) (Stroebe, 2010).

### 3.1. Identification of Limitations in the Use of Traditional Metrics

A number of limitations arising from counting the number of citations or publications have been examined by a significant number of articles; for instance, Minasny et al. stated the conflict between the number of publications and citations in different databases due to their varying structures and inputs (Minasny,2013). The average number of citations per publication is highly sensitive to changes; for instance, if a researcher has only one highly-cited article, this average becomes skewed (Selek, 2014) (Meho, 2008). The citation time-lag effect (Neylon, 2009) (Kali, 2015) is another issue; in most models, citations and publications are treated equally for all co-authors involved in the research, regardless of their varying levels of contribution and activity (Sahel, 2011). Some have also addressed the question of the extent to which citations can reflect the quality of an article, particularly when a paper may focus more on practical aspects rather than theoretical ones (Pinnock, 2012). Furthermore, an article might become a "hot paper" due to its utility, controversial nature, or other factors, while lacking substantial intellectual depth or maturity, merely presenting general ideas (Stroebe, 2010) (Sahel, 2011) (Eyre-Walker, 2013). In addition to these limitations, some authors argue that relying on citation and publication counts can lead to unintended negative consequences in evaluating a researcher's success, potentially resulting in distortions and manipulations such as self-citation or gratuitous citation (Moustafa, 2016). 9 articles (7.6%) have discussed general models and criteria regarding a researcher's success. These models and criteria primarily suffice with the counting and enumeration of general metrics; thus, applying the term "model" to them might be an overstatement (Niederkrotenthaler, 2011) (Kreines, 2016). The Journal Impact Factor (JIF), which is commonly recognized as a quality metric at the journal level (DiBartola, 2017) (Benchimol-Barbosa, 2011), was examined in 50 articles (42.3%) concerning the evaluation of single-author outputs. A number of articles identified the JIF as an informal assessment of researchers' success in countries such as France and China (Slim, 2017). The JIF is the best predictor of an article's propensity to receive scientific citations within a scholarly ecosystem (Bornmann L. a.,2015).

The Journal Impact Factor (JIF) has limitations when indicating journal quality (Santangelo, 2017), such as the possibility of being unfairly influenced by poor-quality articles that are cited extensively as a form of public critique due to their significant flaws (Agarwal, 2016) (Ravenscroft, 2017) and it may foster corruption within the scientific community as a result of quid pro quo exchanges between researchers and journal editors. Other criticisms have focused on the use of the JIF for evaluating individual articles or the specific researchers who authored them (Welk, 2014). Some critics argue that employing the JIF to measure an individual researcher's success encourages others to publish their work in inappropriate high-impact journals, which ultimately leads to their articles not being read by the relevant researchers within that specific field (Taylor, 2015) (Christopher, 2015). Furthermore, a journal's popularity is a poor indicator of the quality of any individual article; the distribution of citations used to calculate the JIF is highly

skewed (meaning a small number of articles receive a vast majority of citations while the rest receive none). Ultimately, many experts consider the JIF an inappropriate metric for evaluating individual researchers, as it is a cumulative measure of a journal's publications and provides no information regarding any specific article (Finch, 2010) (Neylon, 2009) (Sahel,2011) (Jokić, 2009). Nonetheless, Bornmann and Pudovkin stated that the use of the JIF for evaluating individual researchers is appropriate in only one case: regarding a researcher's recently published articles that have not yet had the opportunity to receive citations (Bornmann L. a.,2015).

In light of the aforementioned points, the literature review results indicate that no single citation-based metric is sufficient on its own to cover all expected objectives for evaluating individual researchers, and in certain instances, such metrics are even inappropriate. All prevalent metrics focus on a single dimension of an individual researcher's success and, consequently, fail to measure other aspects of success. The limitations of some of the most commonly used citation-based metrics are highlighted below:

1. The challenge of varying citation patterns across different research fields.
2. Time-dependent issues stemming from differences in the type and application of a researcher's activities.
3. Prioritizing impact over metrics, or quality over quantity, and vice versa.
4. The time-lag effect of citations.
5. "Gaming the system" and the ability to use self-citations to distort metrics.
6. Failure to account for the order of authorship.
7. Treating the participation or non-participation of authors in publications as equal.
8. The establishment of the "Publish or Perish" culture.
9. The potential for stifling innovation in favor of following prevailing trends.

### 3.2. The Risks of Solely Relying on Traditional Evaluation Methods

However, a specific enumeration reveals that certain risks arise from models and metrics that are flawed, insufficient, and sometimes redundant. Research conducted in various scientometric articles indicates that 90% of scientific literature is authored by only 20% of researchers (Aoun, 2013). Even after excluding non-unique individuals, this figure drops to 10% (Biswal, 2013). Being ranked among the top 1% of researchers worldwide who have achieved the highest scientific output does not imply that these individuals outperform 99% of all researchers. Rather, it signifies that they are ranked among the top 10% of the 'article-writing' population out of the total scholarly community (Diem, 2013). To clarify this risk, imagine someone who becomes one of the top 10 athletes in a sport like tennis. Does this imply that this athlete is among the top 10 out of the seven billion people on Earth—assuming everyone plays tennis—or only among those who pursue tennis professionally? Similarly, the phrase "I am in the top 1%" should not be interpreted as the researcher’s presence in the top 1% of the entire community of academics and scientists; however, unfortunately, this is exactly what happens (Haslam, 2009). Risks of this nature, based on the analysis of the documents selected for this study, have been summarized in Table 1 .

*Table 1: Risks identified if relying on citation-based evaluation*

| Risk Name | Description | References |
|---|---|---|
| At the top of leading universities | Research indicates that the tendency toward a general attribution of the title "top university," without regard for research per capita, is a common practice. Without accounting for the number of potential researchers in calculations, a strong university may be identified as weaker than a less capable one. | (Arimoto, 2015), (Belter, 2015), (Diem, 2013) |
| Highly Cited Professor | In the history of science, we have repeatedly witnessed the rejection of a scholar's statement, description, scientific theory, article, or book. Rebuttals are generally more frequent for some of the most erroneous or even ridiculous theories than for precise scientific theories and works. This point causes any researcher intending to scientifically critique a weak theory to cite it. As a result of these citations, which stem from the scientific weakness of the theory's creator or the scientific output, the author may unintentionally become the owner of a "hot" and "highly cited" paper in the history of science. Therefore, merely receiving a high number of citations is not a reliable source for evaluating a researcher; one must carefully consider whether the direction of those citations is positive or negative. | (Finch, 2010), (Haslam, 2009) |
| Overlapping Scientific Outputs | Science has a cumulative nature; meaning it develops bit by bit through the efforts of scientists, and as the saying goes, each scientist "stands on the shoulders" of their predecessors. However, sometimes with this very justification, scientific outputs without any significant achievement are presented as new scientific products. By comparing a researcher's works, one feels that only a very small step has been taken in the new article relative to their previous ones—a step that is not at a level to be considered an independent paper. Instead, it outwardly appears as a serious and noteworthy independent article. What is the issue? The issue is often that a new paper has been created merely by changing the research methodology, a novel phrasing of the problem, or a change in the statistical population, etc. | (Diem, 2013), (Kaatz, 2015), (Diem, 2013) |
| The Dissolution of the State via Indicators | Numerous scientific documents in the field of research evaluation report that researchers, in order to enhance their research status, entrust themselves to indicators presented by world-renowned bibliometric authorities. On the surface, this action appears rational; however, in many cases, it is not even | (Diem, 2013)& (Hicks, 2015) |

| | | |
|---|---|---|
| | prudent and actually conflicts with the national interests of countries. International science and technology indicators govern universities and research institutes even more than central governments do! It is these indicators that prevent a scientist from stepping away from paper-writing to solve regional and ecosystem-specific issues, or from dedicating their energy to producing technological solutions for local problems. This is a form of "soft governance" that diminishes the motivation of national scientists to serve underdeveloped and developing countries. | |
| Gaming with Ranking Institutions | According to some scientific documents, if a researcher is evaluated more favorably by the indicators of one evaluation institution compared to others, they tend to disclose their better ranking while concealing their status in other ranking systems. For instance, if a researcher's standing in the Leiden Ranking is better than their position in QS, they will proceed to announce their Leiden status and show no inclination to disclose their inferior standing. | (Arimoto, 2015)& (Finch, 2010) |

### 3.3. A Novel Approach to Evaluation: Introducing Altmetrics as a Complement to the Traditional Approach

Apart from the ethical principles governing the research process—which must be observed by the researcher in relation to participants and the publication of results—other ethical rules concerning the researcher as an individual are also noteworthy. (Halvorson, 2016). It might initially appear that no researcher requires specific instruction regarding ethical issues such as honesty, integrity, and the avoidance of plagiarism and fabrication; however, the frequent occurrence of scientific plagiarism (Azer, 2016), disclosure of information by researchers (Altmetrics, 2013), and fabricated reports of unconducted research processes (Duffy,2011), etc., indicate that sole reliance on common research metrics may be accompanied by various risks. Consequently, altmetrics are recommended to alleviate the distress caused by the weaknesses of research metrics, particularly regarding individual researchers. By reviewing scientific citations in this regard, a list of fundamental altmetrics has been identified as follows.

*Table 2: Summary of the altmetrics that correct the malfunctions of traditional metrics*

| No. | Altmetric | Description | Selected References |
|---|---|---|---|
| 1 | Honesty | Honesty in presenting results and their distribution and dissemination to the research community, and precise citation of the research source. | (Cronin B, Sugimoto CR., 2014)<br><br>(H, 2013) |

| | | | |
|---|---|---|---|
| 2 | Universality | The necessity of ensuring the publication of research results (except for security reasons) to enhance the scientific understanding of society, better identify the needs and interests of the people, and determine science and technology priorities. | (Cronin B, Sugimoto CR., 2014) (Zahedi Z, Costas R, Wouters P, 2014) |
| 3 | Acceptance of and Commitment to Professional Responsibility | The necessity of possessing the necessary and sufficient qualifications for professional research and avoiding duplication in the research topic. | (K, 2015) |
| 4 | Integrity | Citing the source even in cases of paraphrasing, and respecting intellectual property rights in the utilization of information. | (K, 2015) (Mehraban S, Mansourian Y, 2014) |
| 5 | Courage | A firm resolve in research and avoiding the exaggeration of problems and obstacles. | (Mehraban S, Mansourian Y, 2014) |
| 6 | Addressing Essential Societal Issues | Selecting an appropriate topic for generating useful knowledge and striving to discover the truth. | (Mehraban S, Mansourian Y, 2014) (F W. , 2011) |
| 7 | Receptiveness to Criticism | Avoiding pride and intolerance to improve work and maintain scientific vitality and enthusiasm. | (K, 2015) (Mehraban S, Mansourian Y, 2014) |
| 8 | Understanding of Laws, Policies, and Regulations | Awareness of professional and governmental organizational regulations and policies, as well as national strategies in the design, implementation, and reporting of research. | (F .. G., 2012) (Li X, Thelwall M, Giustini D, 2011) |
| 9 | Accountability | Accountability to employers, financial sponsors, and other private and public institutions, and especially toward society. | (Li X, Thelwall M, Giustini D, 2011) |

### 3.4. Discovering the Components of CREM

Given the research objective, which was to present a model derived from a meta-synthesis of scientific documents, the scrutiny of the model's components is of significant importance. To this end, and with regard to the implicit and explicit solutions found in the selected documents, the components of the model have been identified as shown in the table below. The arrangement of these components will be presented in the conclusion section.

*Table 3: Discovering the components of a comprehensive researcher evaluation model*

| Level | Category | Components |
|---|---|---|
| First | Contextual Conditions | Field of Study (Hicks,2015), Research Expertise (Efron, 2011), Co-authorship (Diem, 2013), Individual Research Background (DiBartola, 2017), and Preoccupation and Living in Relation to the Subject (Azer, 2016) |
| Second | Support Models / Ecosystem | University-Industry Relationship, University-Society Relationship, University-Government Relationship (Diem, 2013) |
| Third | Evaluators | Peers and University (DiBartola, 2017), Employing Business (Li X, Thelwall M, Giustini D, 2011), The Public (Azer, 2016) |
| | Credibility-Building Indicators | Receiving Citations, Trending Articles, Download Rates of Articles and Scientific Achievements, Commitment to Promotion and Discourse-Building<br><br>(Abramo, 2012)& (Arimoto, 2015) & (Bar-Ilan J, 2013)& (DiBartola, 2017)&( Eyre-Walker, 2013) |
| | Intrinsic Bibliometric Indicators | Research Portfolio, H-index, Impact Factor of the Most Important Target Journals, Altmetric Status<br><br>(Arimoto, 2015) (Altmetrics:, 2013) (Efron, 2011) |
| Fourth | Wealth Creation | Economic Value Added and Economies of Scale (Demetres, 2017), Reduction of Production Costs (Azer, 2016) |
| | Theorizing | Idea Generation, Providing Governance Solutions, Expansion of the Scientific Domain<br><br>(Aoun, 2013) & (Azer, 2016) |
| Fifth | Social Authority and Welfare | Maximum Welfare, National Security, Internal Strengthening of the Country, Strengthening International Standing<br><br>(Diem, 2013) & (Christopher, 2015) |

## 4. Conclusion and Provision of CREM

In this study, 118 scientific articles regarding methods and metrics for evaluating individual researchers have been analyzed. Most articles described pre-existing criteria; the majority of these articles addressed the strengths and limitations arising from evaluation methods and indicators for individual researchers, while others focused on the dysfunctions related to these indicators and methods. The majority of the discussions were dedicated to topics such as the Journal Impact Factor, counting the number of articles and scientific publications, assessing article quality, equivalency issues, and finally, Altmetrics. Findings indicate that measurement based on the Impact Factor of journals and simple counting—although highly widely used and practically trusted by the scientific community—faces very severe deficiencies, such that it is conceivable for evaluation to turn into its own antithesis and fall into the hazards arising from such evaluation. To overcome these shortcomings, turning to Altmetrics has been recommended in scientific documents as a panacea for the weaknesses resulting from the application of traditional evaluation methods. This does not mean that relying solely on Altmetrics is sufficient; rather, it is proposed as a complement and corrector for the evaluation system of individual researchers. Ultimately, the researcher evaluation model can be presented as follows. This multi-level and comprehensive model consists of six levels:

**The first level** focuses on the individual conditions of the researcher and their promotion system in higher education, as well as the extent of commitment to networking with the scholarly community for the production of scientific documents. **The second level** considers the research ecosystem provided by the university system for defining, supporting, and the practical application of research results. It is evident that the primary agency of this level is not directed at the researcher personally but relates to indicators such as the University-Government-Industry-Society relationship. **The third level** simultaneously addresses credibility-building indicators, which represent the scientific strength or weakness of the researcher, alongside the intrinsic bibliometric indicators emphasized in the prevailing tradition of conventional evaluation. At this level, the primary evaluators are clearly stated, and the evaluation system ranges from peer review (for basic sciences) to the general public (for applied sciences and the application of science). **The fourth level** includes an explicit statement of components monitoring the primary outcomes of effective science in wealth creation or the expansion of theory and theorizing. **The fifth level** emphasizes that the definitive result of research must, in the long term, lead to the attainment of social authority and welfare. Otherwise, even if the researcher's work is considered "good" according to traditional evaluation criteria, the scientific output and the researcher's science are questionable and require fundamental revision due to the failure to increase authority or social welfare.

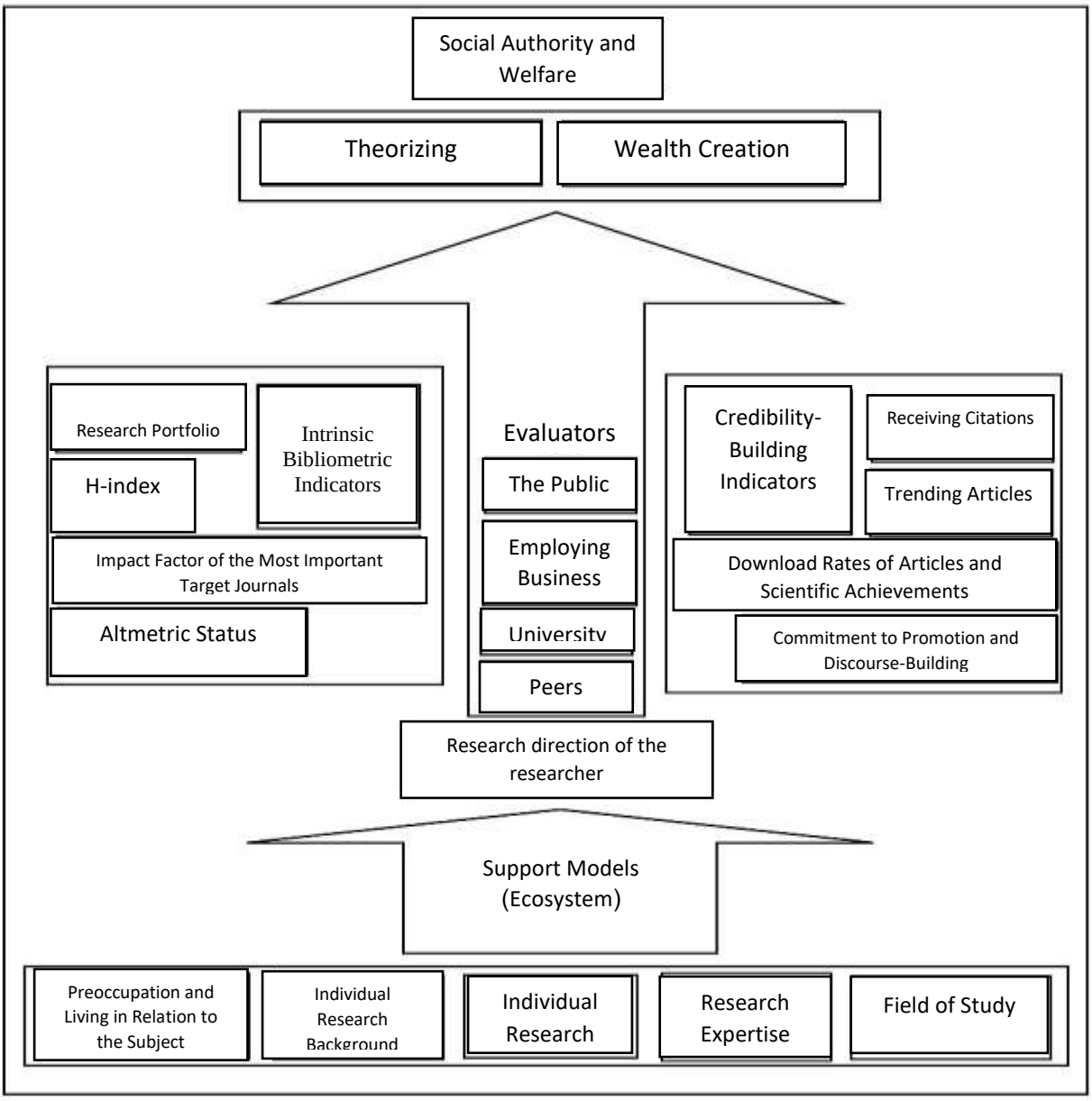



*Figure 2: Comprehensive Researcher Evaluation Model (CREM)*

The model, in addition to being the result of synthesizing components obtained through documentation (Table 3), was provided to experts; it was accepted after incorporating modifications and adjustments into the presented evaluation model. The revised model was again provided to the experts and received their full endorsement. These experts include: the Head of the Executive Group for the Comprehensive Scientific Map of the Country, a member of the Science and Technology Discourse-Building Group in the Second Step of the Revolution, the Vice President of Education at the University, a University Faculty Member, two researchers in the field of Bibliometrics, and doctoral graduates in the fields of Science and Technology Policy and Economics.

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