**Introduction to**

**Scientific Publishing**

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InTRODUCTION

The purpose of this publication is to acquaint students of the doctoral study programme of industrial engineering at FAME TBU in Zlín with basic practices and procedures in the field of information resources, and information literacy. These students already gained relevant experience with scientific literature in the earlier stages of their studies. Therefore, more advanced services and technologies have been included in this text as doctoral students are expected to be able to use these. The second part of this publication deals with the basics of scientific publishing and as such it represents a completely new matter for the students. For this reason, it is also more detailed. However, both parts of this work are interconnected as one´s orientation in information resources is a prerequisite for their subsequent publication activity.

# MetHODOLOGY OF RESEARCH AND DEVELOPMENT ASSESSMENT IN THE CZECH REPUBLIC

The methodology of the Research and Development evaluation in the Czech Republic is important in terms of author´s prestige but mainly because of the funding of research institutions. All publication activities of academics are regularly submitted to central registers. Subsequently, the mother institutions of authors receive adequate financial means. Therefore, it is of utter importance that researchers are familiar with the evaluation methodology, publish in quality journals, or create other types of publication outputs which the methodology acknowledges and finances.

## New Evaluation System for Research Organisations

The new guidelines, valid since 2017, for evaluation of research organisations **have brought changes to the current evaluation system, and to the new “Methodology for Evaluating Research Organisations and Research, Development and Innovation Purpose-tied Aid Programmes”** approved under the Czech Government Resolution No. 107 of 8 February 2017. (“Methodology for Evaluating Research Organisations and Research, Development and Innovation Purpose-tied Aid Programmes”, © 2015).

The newly approved methodology is often referred to as “Methodology 17+” as it is a new concept of evaluation of research organizations and the subsequent allocation of funds over a three-year period. The new evaluation system will therefore be gradually implemented in the next three years 2017-2019. A five-year period evaluation is to be conducted from 2020 onwards.

One of the basic principles of the new evaluation system **is the division of research organizations (RO) into three different levels** (the national or central level, evaluation at the level of funding providers, evaluation at the level of management of the research organization). According to this principle, research organisations will be newly divided into three groups or segment, namely higher education institutions, e.g., universities, institutes of the Academy of Sciences of the Czech Republic, and the sectoral research organizations and industrial research organisations (“Methodology for Evaluating Research Organisations and Research, Development and Innovation Purpose-tied Aid Programmes”, © 2015).

**The evaluation of the level of international cooperation in individual research organizations will be another important change compared to the current state.** Yet another novelty will be **the** **assessment of the quality of research organizations through five core modules**, including: Quality of selected results, Research performance, Societal relevance of research, Viability, and the module of Strategy and conceptual framework. The relative weights of modules shall reflect the position and mission of each RO in the Research and Development system (abbreviated as R&D). (“Methodology for Evaluating Research Organisations and Research, Development and Innovation Purpose-tied Aid Programmes”, © 2015).

The valid full-text version of the Methodology for the Evaluation of Research Organizations is to be found on the Office website of the Government of the Czech Republic:

https://www.vyzkum.cz/FrontClanek.aspx?idsekce=695512

## Definitions of types of results

A separate appendix of the research organisation evaluation Methodology is Appendix 4, which contains a definition of the types of results:

https://www.vyzkum.cz/FrontClanek.aspx?idsekce=799796. The results are divided into two categories. The first category defines **publication results**, the second category specifies **non-publication results.**

Individual types of results that have been achieved through research activities supported by the Act No. 130/2002 Coll., are indexed in **the Information Register of R&D results (RIV database):** [**www.rvvi.cz**](http://www.rvvi.cz/)

## Results from the Web of Science and SCOPUS databases

Internationally recognised citation databases **Web of Science** by Clarivate Analytics and the **SCOPUS** database by Elsevier index articles from prestigious disciplinary journals as well as other types of documents that are included in the new methodology. The aim of academic authors should, therefore, primarily be to publish their outputs in periodicals that are included in the Web of Science or Scopus. The criteria that the publication results must meet in order to appear in these databases are further defined in the already mentioned RO valuation Methodology (“Methodology for Evaluating Research Organisations and Research, Development and Innovation Purpose-tied Aid Programmes”, © 2015).

**1.4 R&D result inclusion procedure at TBU**

The method of inclusion of the research and development activities is governed by the Rector´s Decree No. RR /4/2018.

The system for primary data evidence and submission at the university level is **the OBD** (Personal Bibliographic Database). From the OBD system, the inserted files of research results are annually sent to **the RIV**. The Rector´s Decree also specifies the process of data input into the OBD system.

The TBU Library monitors publication results in the Web of Science and Scopus citation databases once a week. These results are then loaded into the OBD system by the TBU Library.

Basic records of industrial property results in the OBD system are created by the TBU Technology Transfer Centre. These records are updated once every three months (Rector´s Decree No. RR/4/2018, “Procedure for Inclusion of Results of R&D Activities in the Personal Bibliographic Database System (OBD)”).

Other research activities are put in the OBD system according to internal procedures of each TBU component.

# THE PUBLICATION PROCESS



Figure 1 - Diagram of the publication process (Wipperman, 2016)

The publication process goes through the following stages (Kratochvíl, 2011):

Writing an article - writing an article is a matter of the author or a team of authors. In case of a team, it is advisable to define the roles of individual authors in the article making process at the very beginning. At this stage, the primary support from the library means enabling access to relevant information resources. The author can also use the so-called citation (reference) managers to help them put the cited sources in the correct citation standard or norm. More information in a separate chapter.

Choosing a journal - the selection of a journal requires enormous attention. In the ideal case, a journal is chosen at the beginning of writing an article. This enables the author to structure the anticipated publications according to the requirements of the selected journals. In practice, however, this condition is not always observed. Let us not forget the possibility of article being rejected by the intended journal. More about choosing a journal for publication in a separate chapter.

Factual and language proofing - the article must meet the formal requirements of the intended journal (particularly the format, image and graph editing, the prescribed number of characters, and the citation standard). At the same time, it is highly advisable to strive for a high standard of language, as a very common reason for article rejection is its poor English.

Submitting an article to the editor - the article is then required to be sent to the editors of the selected journal for consideration. The editor decides, within a few weeks, whether the article meets the basic criteria for inclusion in their journal. If this is not the case, the article is rejected. In the opposite case, it is passed on to reviewers. The whole process usually takes place in editorial systems that high-quality publishers use, and in which the author can track the stage of the article processed.

The review process – is a standard process used by all reputable scientific journals. A paper is usually submitted to be reviewed by two independent experts from a given scientific area who evaluate its quality, recommend changes and adjustments, etc. More in a separate chapter.

Paper revision - an article must usually be revised by the author in accordance with the reviewers´ comments and recommendations. Therefore, if the author is requested to revise their paper, it is a positive sign that the article has not been rejected and may be accepted for publication after the required changes or proposed corrections are made.

**Accepted article and related administration** - before publishing an article, it is necessary to sign a contract with the publisher clearly defining the rights and obligations of both parties. This process, often underestimated by authors, requires due attention. Such licence agreement with the publisher is to define copyright and any further rights. If the author subsequently wants to share the article through Internet repositories, personal websites, etc., the publisher´s contract should clearly define such provisions.

**Publication of the article** - even after publishing an article in the journal itself, it is advisable that the author disseminates their work accordingly. An access to their work can positively affect the number of readers and, consequently, the citation count of the article. Institutional or business repositories, academic networks or authors´ personal site are also used to disseminate scholarly articles. The release deadline sometimes poses a problem. The peer-review process itself is lengthy, and it might take some more time for the publisher to include the article into one of their issues. Therefore, in practice, electronic versions of articles are very often published before they are officially printed. Paradoxically, articles with the official date of publication in 2019 may be electronically available already in 2018. Quite often, the authors also receive pre-prints or post-prints of their publications fairly soon. The reason for this is the fact that in some disciplines the development is so dynamic that any delay in the publication of articles would result in a rapid obsolescence of the information contained.

# SELECTING A journal FOR PUBLIcation

**When choosing a journal, it is necessary to respect the following basic procedures:**

1) Proceed according to the Methodology of R&D evaluation, i.e., the chosen journal should be included in the Web of Science or Scopus databases. The new methodology introduces the category of “Journal – other” that contains academic journals in which a paper goes through the peer review process. In this case, the journal is a prestigious title witch a certain reputation in its scientific field. Otherwise, (even if the published work is of high standard) the article does not bring the desired result for the institution nor for the author.

1. Inspect the journal where you want to publish. A paper is very often rejected primarily because it does not correspond to the thematic focus of the selected journal.
2. Set realistic goals. Beginning authors may not be successful in journals with a high impact factor at first. Therefore, it is necessary to choose a magazine where the article has a realistic chance of being accepted. It is advisable to consult with your supervisor or a more experienced colleague.
3. Comply with the Author guidelines. These rules are listed on journals´ websites and must be strictly followed. In the event of non-compliance, the article may not be published at all, or it may cause considerable delay in its publishing.
4. Choose a clear Open Access strategy. This means that the author must decide in advance whether they want their work to be published in an open-access journal. If so, they need to find out if fees are required. It is also useful to know the journal´s policy on the possibility of making the article accessible through institutional or subject repositories.
5. Avoid publishing in predatory journals. While such journals claim to be peer reviewed, a real peer review process either does not take place at all or in a very simplified form. Also, publishing articles in predatory journals can mark author´s reputation in the future.

The issue of choosing the right journal with regard to the R&D methodology and with a significant increase in the number of predatory journals has become a rather difficult task. The Think. Check. Submit. service can be of great assistance to authors (<https://thinkchecksubmit.org/>). There is a Czech version available under the title **Vím, kde publikuji**: <http://vimkdepublikuji.cz/>.

# THE REVIEW PROCESS

In order to achieve the highest quality articles (as well as conference papers), every paper is reviewed through the process of **a peer-review.** In this process, selected experts express their views on the content and the quality of the article. There is also a possibility that they will not recommend the paper for publication:

Types of peer review processes (Dědičová, 2014):

Anonymous (blind) peer review – anonymous rating is a standard type. It means that the reviewer does not know the author of the article they are reviewing, and the author does not know the reviewers either.

Open peer review - here the review process is completely open, and the names of reviewers and authors are known to both sides. It is used especially in the fields with a narrow group of experts.

**Double peer review** - the most common type of this process, which is standard in prestigious journals. The paper is evaluated by two selected independent experts.

**Single peer review** - in this case, the article is reviewed by one reviewer only.

Post peer review – the organisation Faculty of 1000 (<http://f1000.com/)> came with a revolutionary concept of peer review. To simplify the publication process, they introduced a so-called post peer review. This means that the author publishes the article in its original version and experts in the given scientific field comment on it in the comments under the published article. A similar approach is also used by an increasingly popular platform PubPeer (<https://pubpeer.com/>). However, this practice also has its negatives. Papers with incorrect results may be published, and these can only be refuted long after the article has been published. Meanwhile, the professional public is being misled and mystified. A similar criticism applies to so-called pre-prints, which are also not reviewed. Despite the critical voices, such new, dynamic forms of scientific document dissemination are becoming more and more popular (Johansson, Reich, Meyers, & Lipsitch, 2018).

The review process is the pillar and the main strength of the traditional publication process. At the same time, however, it often causes delays in the publication of key scientific papers. Ideally, this process should take several weeks, but it actually takes a few months, and it might take even longer when reviewed papers must be repeatedly revised. The issue of the review process has also been debated in connection with predatory journals that have completely devalued the process as such. Ways to optimise and improve this building stone of scientific publishing are being searched for.

Another problem is that reviewers usually do not receive monetary reward for their work. However, quality reviewing is absolutely crucial for scientific publishing, and prestigious publishers strive to build networks of qualified reviewers to guarantee the maximum relevance of published outputs. An important position in this direction is represented by the company **Publons** (https://publons.com/home/), which has created a network of more than 150,000 professional reviewers, and whose services are used by the world´s largest publishers. Not surprisingly, in 2017 Publons was acquired by Clarivate Analytics (Allegrezza, 2017).

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# THE STRUCTURE OF An ARTICLE

Scientific articles are usually clearly structured according to the rules of the source journal. Typically, the article structure is as follows (Sedlařík, 2014, EASE, 2017):

The title - should be neither too long, nor too short. In any case, it should accurately reflect the content, should be unambiguous and comprehensible to the professional community.

Author´s information and affiliation - a problem with diacritics in Czech names may occur. It is necessary to find out in advance whether the journal can handle diacritic markers correctly. It is similar with affiliation names, i.e., the institution under which the author publishes. In the case of Tomas Bata University, it is necessary to ensure that the name is in the official international form of Tomas Bata University in Zlin (I intentionally used Zlin to contrast with the official Zlín, as indexing the letter í can be problematic in many foreign journals and databases). It is also very important to define the roles of individual researchers within the authors´ team in a timely manner. Who will be a corresponding author, etc. The order of the authors should reflect their share of work. The first listed are the authors whose contribution is the largest. The order of authors´ names should be agreed on in advance before submitting the manuscript to the editorial board and should be agreed on by all authors. Any subsequent changes should also be approved by all team members. Each author must list their own affiliation and ideally an email address. The contact details must then be provided correctly for the so-called corresponding author, who is responsible for any subsequent communication following the release of the article.

Abstract - a brief statement of the content of the article, usually in one paragraph. Some publishers require a structured abstract that basically copies the structure of the article. It must duly reflect the content of the article as the abstract is freely available even in paid articles and serves as the main source of information prior to purchase. It is also advisable to incorporate key words in the abstract. This will positively affect the searchability of the article.

Keywords - it is necessary to define several keywords that precisely define what the article is about. In a number of disciplines, key words need to be selected from predefined subject classification system (JEL in Economics or MeSH in Medicine).

Introduction – contains the basic delineation of the topic, the objectives of the research and the introduction of the issue

Literature overview - please note, this does not mean bibliography. It is only an overview of other authors who also deal with the same topic, or what conclusions they have arrived to. It is a part of the main body of the article. Studying relevant information sources is the basis of academic publishing. The list of literature consulted, the bibliography itself, is listed at the end of the article.

Methodology - at the beginning of the article it is usually necessary to describe the methodology chosen for the article, including the reasons why this methodology is most suitable for the purposes of the article. At the same time, it is necessary to specify in detail how the research was conducted, and to state all the circumstances that may have affected its outcome.

Results – this passage brings new findings made by the authors in their research. New knowledge must be provided in an appropriate and clear manner. In no case can data be modified, omitted or otherwise altered as work could be considered a scientific fraud.

Discussion and conclusion - at the end, it is necessary to summarise the findings that have been published in the article and to interpret these correctly. This is where research questions are to be answered and results compared with already published data. Only methodologically convincing evidence needs to be used to support one´s point.

Acknowledgments - in this section, thanks are given to people who somehow contributed to the successful publication of the article. Further, financial resources or projects under which the research was implemented are listed here.

Bibliography - is a complete overview of the literature used and consulted while writing the paper, in the relevant citation norm preferred by the journal. It strictly respects the basic principles of citation ethics (see separate chapter on the topic).

Of course, the structure of the article may vary according to the source journal instructions, and the type of article that is being submitted. The most common type is the Research Article, but it may also include short communications, letters or reviews, that are shorter and more specific. In any case, it is necessary to respect the binding guidelines for authors which are available on individual journal websites.

# pUBLIcation ETHICS

When writing and publishing an article, it is necessary to honour certain ethical rules. The basic thing is, of course, the truth and transparency of the scientific process. It is not possible to falsify or modify the results of experiments, or to interpret them purposefully, etc. Furthermore, other principles need to be observed (Machková, 2014):

Correct citing

It is not just a formal adherence to the citation standard prescribed by the journal. It is also necessary to actually cite the sources the author used in their paper. One frequent vice, for example, is an excessive degree of autocitation in the article while the author does not actually draw on their previous work. Another transgression is “pseudo-citation” of colleagues or important scientists in the field, whose work the author in fact did not use for the particular paper. Another issue is the pressure of journal publishers on the author to quote other articles from the journal, or at least articles from the same publishing house in order to increase the impact factor of the journal. In such a case, the author is in a very difficult situation because their paper might be rejected when this condition is not met. Nevertheless, the principles of citation ethics should always apply.

Avoiding plagiarism

Rather than a new, creative contribution, some papers recycle either author´s own work or even work by other authors. This practice is unacceptable. Quality publishers perform anti-plagiarism check-ups before publishing articles using advanced tools, in particular the CrossRef Similarity Check service based on iThenticate technology (<https://www.crossref.org/services/similarity-check/>). In exceptional cases, especially with conference papers, the author might be asked to provide anti-plagiarism confirmation themselves. They can then contact the staff of the TBU Library who can perform the required check-up and provide the relevant document. Of course, foreign journals check the submitted manuscripts, in particular against databases of English-written texts. In the Czech environment, however, there is a similar service that can effectively check the originality of Czech-written texts. It is Odevzej.cz (<https://odevzdej.cz/>). This service complements the more familiar system Theses.cz (<https://theses.cz/>), which is used by almost all Czech universities for anti-plagiarism check of theses.

Do not send article to more than one journal at a time

The article must be submitted to one journal at a time. If it is rejected, only then another journal may be contacted.

Report any conflict of interest

If the author is in any conflict of interest that might affect, for example, the results or interpretation of the presented article, they are required to disclose this fact in advance.

Prestigious publishers are members of the organisation COPE ([http://publicationethics.org/),](http://publicationethics.org/)) which defines ethical standards for scientific publishing. This organisation continuously publishes recommendations, standards and examples of good practice in the area of ​​ethics of the publication process.

In the event that after the publication of a paper serious doubts arise regarding author´s adherence to ethics criteria, then the paper may be withdrawn or retracted from the journal. This is quite common with even the most consistent journals where a thorough peer review process and an antiplagiarism check is done prior to publishing. Naturally, scientific reputation of the authors of such articles can be seriously disrupted. These trends are monitored by the initiative Retraction Watch (<https://retractionwatch.com/>) and a newly emerged database Retraction Database (<http://retractiondatabase.org/>).

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# REFERENCe AND CITATION MANAGERS

Citing scientific literature is a burning issue. The author must not only observe the basic rules of citation ethics, but also acquaint themselves with a myriad of citation styles used by individual scientific journals, which can often be a major pitfall. For these situations, numerous software called citation or reference managers have been developed to help eliminate such problems. These products are available in both commercial versions and as open source systems. Their basic functions enable to download records of the literature used, to classify them into folders, to add fulltexts and, most importantly, to form bibliographies in the required format. The citation managers have a command of a vast number of citation norms and the conversion of the record into the required format is a matter of a few clicks. At the same time, most of these services also offer Microsoft Word plug-ins allowing to generate quotes directly when writing an article.

*Paid citation managers:*

RefWorks (<http://www.refworks.com/)> - RefWorks is the most widely used citation manager in the world, and it is also licensed by TBU in Zlín. At <http://www.utb.cz/knihovna/veda-a-> vyzkum/refworks you can find all instructions on how to work the system as a TBU user. RefWorks also supports citation according to the ISO 690 standard, which is valid in the Czech Republic.

EndNote (<http://endnote.com/)> - EndNote is a direct competitor of RefWorks, delivering very similar functionality. It was produced by Clarivate Analytics which offers their Web of Science database subscribers EndNote Basic for free. The system is also available to TBU users after a free registration in Web of Science. However, the standard desktop version of EndNote is a paid product.

CitacePro (<http://www.citacepro.com/)>- is a Czech product that contains a large number of foreign citation standards. It is a higher version of Citace.com, which will be discussed below. The CitacePro system is also available for TBU users: <https://knihovna.utb.cz/sluzby/kurzy-konzultace-vyuka/citace-a-citovani/citace-pro/>

*Freely available systems:*

Zotero (https://[www.zotero.org/)](http://www.zotero.org/)) - the citation manager Zotero is practically a plug-in for the Mozilla Firefox Internet browser. Due to its simplicity and number of language mutations, it has gained a large pool of users. Its interdependence with the browser is a minor disadvantage but it is a viable system whose development and improvement is constantly worked on.

Mendeley (<http://www.mendeley.com/)> - besides being an academic social network, Mendeley also functions as a citation manager, free to every user upon free registration.

CiteUlike (<http://www.citeulike.org/)>- this system is another very popular citation manager available for free.

Citace.com (<http://www.citace.com/)>- this popular service has long served in the Czech environment for generating citations exclusively in the citation standard ISO 690.

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# OPEN ACCESS VS. TRADITIONAL PUBLICATION PROCESS

In the traditional concept of publication process, which has been applied for many years and which still prevails, it is customary that papers are published on a commercial basis in the highest quality journals. This means that only privileged researchers, whose institutions have the means to pay for subscriptions to these journals, will access key research results. This, of course, restricts a large number of other researcher and, in some ways, it also hinders the process of scientific exploration itself. Therefore, a strong movement has been formed in recent years requiring access to scientific articles in the form of Open Access (Suber, 2015).

Open Access means, in a very simplified way, free access to articles for the end user, including other requirements.

There are two basic concepts of Open Access:

1) **Golden Road** - making articles available to users through freely available journals

2) **Green Road** - making articles accessible to users through Internet repositories

Of course, these two paths are intermingled and complementary. Such new requirements in connection with Open Access pertain to authors and their home institutions, as well as publishers and grant providers who are still adapting to this new trend.

The basic principles and rules for Open Access publishing were defined at three major conferences:

1) Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/)> - the signatories encouraged the release of funds to transform the current publication mode and encouraged institutions (notably the academic ones) to archive produced documents in institutional repositories with free access.

1. **Bethesda Statement on Open Access Publishing (**[http://legacy.earlham.edu/~peters/fos/bethesda.htm)](http://legacy.earlham.edu/%7Epeters/fos/bethesda.htm)) – by this declaration major institutions from the American continent joined the requirements for Open Access to science and research.
2. **Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities** (<http://openaccess.mpg.de/Berlin-Declaration)> – this so-called Berlin Declaration expresses the readiness and willingness to freely disseminate publication results of those institutions acting as its signatories. Even in the Czech environment, some institutions have already signed the Berlin Declaration (e.g., The Academy of Sciences of the Czech Republic, Charles University or Brno University of Technology).

Although the Open Access movement has been striving for a change of the scientific publishing paradigm for almost 15 years, it is still a mere addition to the classic “commercial” model. Recently, however, it has become clear that the principles of Open Access publishing are increasingly being implemented into publishing policies of significant institutions. For this reason, the inclination to Open Access should continue in the years to come (Piwovar et al., 2018).

## OPEN ACCESS – GOLDEN ROAD

Publishing scientific knowledge through scientific journals has been around for centuries. However, with the expansion of the Open Access phenomenon, there has been a considerable shift during which journals divided into several categories. From the Open Access point of view, these are the most important examples:

Open Access Journals - they are journals (and their numbers are still growing) that are free for the end user. Some of them choose the so-called APC (Article Processing Charges ; see below), but many do not require these fees and their funds come from other sources. A comprehensive overview of quality free journals can be found for example in Directory of Open Access Journals ([http://doaj.org/).](http://doaj.org/)) It represents a highly respected database of approximately 11,000 scientific journals, which are very carefully evaluated and each of them has to meet demanding criteria in order to be included in the database. It is a sort of a whitelist of approved Open Access journals.

The often-mentioned disadvantage that can discourage scientists from publishing articles in Open Access journals is that such journals are usually relatively young and often lack the necessary scientific reputation and quality. Despite that, the number of freely available journals in the Journal Citation Reports database, which contains prestigious journals with an impact factor, rises annually. Also, journals that have so far been published in a strictly commercial version have been switching to Open Access platforms.

Hybrid journals - these are verified journals offered for the price of standard subscription. However, if the author pays APC their article in the given issue is available to others for free. In practice this means that the electronic versions contain several articles available only to subscribers, and other articles, for which the article processing charge has been paid, are available freely. This model is standardly offered by the most prestigious world publishers (e.g., Elsevier or Springer). The problem remains that the fees are generally very high, sometimes even several thousand dollars.

Multidisciplinary Open Access journals (megajournals) - these journals are based on the principle that they publish a large number of articles in various scientific disciplines, and the authors are charged considerably lower fees to make their paper openly accessible. This is a new economic model that seems to have been successful for some journals. A typical representative of such journals is for example PLOSOne (<http://www.plosone.org/)>or SAGE Open ([http://sgo.sagepub.com/).](http://sgo.sagepub.com/)) However, payment of fee does not automatically guarantee printing of the article, as is the case with so-called predatory journals (see below). On the contrary, each article goes through a standard peer review process to ensure high quality.

This model of publishing has been largely established in the scientific community. APCs are now seen as so-called eligible expenditures in many projects and grants. This means that the fund provider requests publication of the results in the Open Access mode while providing means for APC. The programme Horizon2020 operates this way.

Of course, publishers are also responding to this trend, providing institutions with more favourable APC conditions and in some cases even offering a deferred payment to APC.

## PREDATORY JOURNALS

Unfortunately, with the rise of Open Access publishing and the fact that authors have become accustomed to paying Articles Processing Charges in quality journals, the phenomenon of so-called predatory publishers and predatory magazines has grown. In simple terms, their model is: pay and publish. These journals are usually characterised by a lack of transparency regarding their scientific board and journal editors, suspiciously short review processes, etc. They also often reach out to authors through unsolicited emails and use false metrics to create the impression of quality journals (e.g., universal impact factor, scientific impact factor, etc.)

Jeffrey Beall´s blog ScholarlyOA dealt with this issue in depth, however it disappeared in 2017, among other things because the author received threats and lawsuits by the publishers concerned. Beall´s list was largely subjective, and rather strict towards some publishers, but in the course of its existence it had gained considerable reputation. Although it is no longer up to date, numerous analyses continue to be based on it (Teixeira da Silva, 2017). The site is still available at <https://predatoryjournals.com/>.

Beall´s baton has been passed over to the American company Cabells (http://www2.cabells.com/), which commercially offers research institutions not only a blacklist of predatory journals but also whitelists of verified journals from various fields enriched with more detailed information about given journals (such as percentages of success in accepted manuscripts). It is undoubtedly a valuable service, but it also has critics, in particular for its lack of transparency. While Jeffrey Beall´s list of predators was freely available, and the publishers concerned could object to being blacklisted, Cabells is a commercial service and in such, publishers and the professional public cannot really know who is currently on the blacklist.



Figure 2 – A record of a predatory journal on the Cabells blacklist (Bisaccio, 2018)

The fact is that an incredible amount of predatory publishers and journals has emerged in the recent years (Richtig, Berger, Lange-Asschenfeldt, Aberer, & Richtig, 2018). There are tens of thousands of titles, some of which have already been able to enter the prestigious databases of Scopus and Web of Science. Although databases carefully scrutinise their indexed journals, discovering predatory practices is not easy in many cases and takes time. Such journals are subsequently removed from these databases, but the authors may already have considered them to be prestigious components of citation platforms (Macháček & Srholec, 2016).

An effective defence against predatory journals is thorough reflection and scrutiny of the chosen journal before submitting an article. In case of any doubt, the library staff should be consulted. A very valuable service in this area is the site Think. Check. Submit. In a very clear way, researchers are navigated to select the right kind of journal for their publication. The page is available in many language versions. In 2017, it was also launched in Czech, called Vím, kde publikuji.

A similar problem, perhaps even on a larger scale, are predatory conferences. These are purposeful scientific conferences pretending to be of high academic quality while their main goal is to collect conference fees from participants who present their papers without any substantial scientific benefit mainly due to absence of a good peer review process. Countless predatory conferences are hosted on annual basis, and it is extremely hard to recognise this type of conference especially for inexperienced researchers (McCrostie, 2018). In addition to consulting one´s senior colleagues and carefully examining the event, you can also use a website called Think. Check. Attend (<https://thinkcheckattend.org/>). It is analogous to the same service for journals and provides methods to help choose quality scientific conferences.

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## OPEN ACCESS GREEN ROAD

The green road of Open Access means archiving and accessing articles through Open Access repositories. There are several kinds of such repositories online, but their main mutual feature is providing Open Access to the documents they contained. Typical representatives of these services are institutional repositories, which make their own institutional papers available. Tomas Bata University in Zlín prides itself on own repository at: [http://publikace.k.utb.cz/.](http://publikace.k.utb.cz/)

Another type of repositories are for example repositories such as arxiv.org (<http://arxiv.org/)> for informatics, computer science and physics, or Psycarxiv (https://psyarxiv.com/) for psychology. Another notable repository is the Zenodo ([http://zenodo.org/)](http://zenodo.org/)%20) which serves researchers from numerous scientific disciplines whose home institutions do not have their own repository. Such examiners are then authorised to use the Zenodo archive.

Many authors mistakenly believe that when publishing their article and signing a contract with the publisher, all copyrights are automatically transferred to the publisher, and that they no longer exercise any rights over their article. The truth is, however, that the overwhelming majority of prestigious publishers allow for some kind of access to articles through repositories. They are not usually the PDF print, or typeset, version of the article, but the following forms are usually allowed to be shared:

* **A pre-print of the article** - the first version of the manuscript before sending it to the review process
* **A post-print of the article** - an article version that has been approved for publication after the review process but does not match the final release version that is still being formatted or otherwise edited by the publisher

The author´s rights are available in the license agreement with the publisher or in the terms of the publisher or journal that are available on their website. Similar information is also available in the database Sherpa/Romeo ([http://www.sherpa.ac.uk/romeo/),](http://www.sherpa.ac.uk/romeo/)) which gathers the policies of publishers and journals on archiving and accessing articles via Internet repositories. This service divides publishers into four groups according to their policies in this area. The most important information is that more than 60% of publishers (including the largest ones) allow article access through the Open Access Green Road (“Romeo Statistics”, 2018).



Figure 3 - Journal entry in the database Sherpa/Romeo (“Sherpa/Romeo”, 2018)

The authors should be actively interested in the possibility of spreading their articles. An access in the Open Access regime logically brings more readers and potentially a higher citation count. At a time when increased attention is paid to quality and renown of publication activity in the scientific community, openness and visibility of scientific results is an absolutely crucial matter.

## REPOSITORY OF PUBLISHING ACTIVITIES OF TBU

Tomas Bata University in Zlín has its own institutional repository. The repository of TBU publishing activities is available at [http://publikace.k.utb.cz/.](http://publikace.k.utb.cz/) Document archiving and retrieval is defined by the Rector´s Decree No. RR/4/2018. Each publication of article type, contribution in proceedings, patent and other types of documents are recorded in the repository in the form of a bibliographic record that is completed with a full-text version of the article when provided by the author. Fulltexts are available primarily for internal TBU purposes, however, the proportion of documents that are available in the Open Access mode for the entire Internet is increasing. In the future, increased communication with authors is intended to ensure a significant growth in the number of fulltexts in Open Access mode. The repository of TBU publishing activities is at high technical level and is also linked to the citation databases Web of Science and Scopus, from which it draws real time information on citation counts of individual documents. For each article, an additional set of indicators is available via PlumX, the possibility to import documents into RefWorks citation manager, qualitative journal data, and many other services.

The main task of the repository is to popularise the results of the research activities of TBU and to make them more visible in the Internet environment. For this reason, international repository registers are created to serve as union catalogues for database searching. The repository of the publishing activities of TBU has so far been registered in the BASE, ROAR, OpenDOAR and OAISter systems.

## REGISTRIES FOR OPEN ACCESS REPOSITORIESS

Over the last years, a huge number of different Internet archives emerged. Therefore, there are certain initiatives trying to make these archives more visible and unite them in union catalogues. This way, the user has the possibility to search centrally in a vast number of repositories included.

*The most popular registries:*

ROAR (<http://roar.eprints.org/)> - Registry of Open Access Repositories is a service operated by the University of Southampton. It is a registry of Internet archives, which also allows central searches in their contents.

OpenDOAR (<http://www.opendoar.org/)>- a very similar service produced by the University of Nottingham.

OAIster (<http://oaister.worldcat.org/)>- OAIster is a service that aggregates data from participating archives through the OAI-PMH communication protocol, which is the standard in data exchange between Internet repositories. The service is currently managed by OCLC.

DRIVER (<http://www.driver-repository.eu/)> - DRIVER is a wide-ranging project to support all aspects of Open Access in the European environment. One of its components is a union catalogue for open repositories.

BASE (<http://www.base-search.net/)>- Bielefeld Search Engine is a service that integrates a range of freely available resources.

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# CITATION INDEXES

Citation indexes are valuable in the information services environment, not only as excellent sources of information but also important for evaluation of science and research itself. As mentioned above, papers that are included in the Web of Science and Scopus databases are by far the most valuable results from the Czech viewpoint. There are other databases that can effectively track citation links between documents, authors and institutions, yet the Czech methodology does not take them into account. In addition to specialised narrowly profiled freely available citation indexes, citation can also be monitored by some renowned databases (such as PubMed or Go-ogle Scholar). However, the newest service Dimensions, which has recently entered the information market with enormous ambitions, has earned the greatest attention in this respect, and will be presented below in this chapter in more detail.

The basic added value of citation indexes is that in addition to the articles themselves, they also process citations. This means that a set of sources the author used when creating their paper is provided, and vice versa, we can get information whether the article has been cited by other authors. This gives us a very clear time axis of the research. We are likely to be interested not only in the selected article but also in the information about its sources and follow-up research.

Indexation of citation relationships makes it possible to track citations of individual articles, but also the authors (including h-index), institutions or even countries.

Database details:

## Web of Science

Web of Science (https://apps.webofknowledge.com) is a set of several citation indexes for all scientific disciplines. However, science and technology are significantly more represented in it. Clarivate Analytics, who is behind this product, has recently acquired the system including the related services from the well-known ThomsonReuters (Clarivate Analytics, 2016). Web of Science maintains high quality of the excerpted sources. During its fifty-year history, only a selection of highly scrutinised journals, conference proceedings, and as of recently books, have been indexed. The core of the entire system are bibliographic records from impacted journals. But in 2015, the Emerging Sources Citation Index, which includes progressive regional journals that do not yet have an impact factor, was included in the database. Although they are expected to acquire it in the future (Hardcastle, 2017).

## Scopus

Scopus (<http://www.scopus.com/>) is a much larger resource from the point of view of volume of indexed sources, even though its history is significantly shorter than one of Web of Science. Its focus on European journals is also stronger and the system contains far more social and humanities resources than the Web of Science platform. As of lately, key scientific books are also included here. The producer of the entire system is the Dutch company Elsevier.

Both databases are very similar in their functionalities. Based on indexation of citation data, various analyses of quality of publishing activity can be carried out and publication trends can be monitored in individual fields.

## Incorrect data in Web of Science and Scopus

Quite often, both databases import wrong data from the source journal. Typically, this involves names and affiliations. In this case, the author (or an authorized entity in their institution) has the right to request a correction of the record. In Scopus, these changes are reported via helpdesk; in the Web of Science there is a Request a Correction icon for each entry to report the requested edits. Correction of records usually takes a few weeks. Incorrect data in these databases can damage not only institutions (many international rankings of universities and scientific institutions are based on Web of Science and Scopus), but also scientists themselves (e.g., lower h-index). In case of any problems, it is possible to contact the staff of the library, who are able to request such corrections.

## Dimensions

At the beginning of 2018, Dimensions (<https://www.dimensions.ai/>) was put into operation. It is a product of the company Digital Science, which controls many other services in the field of scientific information and publishing. Dimensions represents a complex platform with state-of-the-art elements and design. Unlike Web of Science and Scopus, the basic version of the service is available to researchers free of charge. The DimensionsPlus version, which contains a number of analytical tools, is only available after the institutional license has been paid. The highest version is Dimensions Analytics which offers the most advanced tools for managing and analysing the information and data contained. Dimensions is a brand-new product and only the future will show if it really is a major competitor for the Web of Science and Scopus citation databases. Its technical solutions and implementation of advanced services, however, suggest that it might indeed be a really strong player of the future (Thelwall, 2018).

Implementation of citation data is currently a major trend in many other services. Citations can be analysed, for example, by CrossRef, which assigns a unique DOI (Digital Object Identifier) ​​to electronic articles (and other types of documents). This identifier has become an absolute standard and is assigned by all prestigious world publishers. The DOI identifier is then listed in the bibliography of each article. This way CrossRef amasses a lot of citation data that can then be analysed. Citation links are also tracked by many subject databases, as well as by search engines of scientific literature or academic social networks. Yet, relevance and quality of the data collected might be a problem. Therefore, for academic purposes Web of Science and Scopus data continue to be used, as they guarantee that indexed citation come from sufficiently prestigious sources. This is the main difference from other services because their sources of citation data are diverse (for example, Google Scholar can find and assign citations from graduate works). It is a question of whether it is appropriate to use such citations for the purposes of evaluating scientific work.

# JOURNAL QUALITY ASSESSMENT

There are many review scientific journals issued currently (the estimate number is exceeding 100,000 titles). It is therefore very important to assess the quality of individual titles. Verified and most respected metrics evaluate the prestige of journals usually based on citation counts. Thus, it is not surprising that the relevant metrics are usually very close to the Web of Science and Scopus citation databases.

## Web of Science citation metrics

Impact Factor - this indicator has long been, despite its indisputable limitations, the most respected metrics in the field of quality evaluation of scientific journals. It is based on a very simple pattern which takes into account the number of published articles in correlation with the number of citations obtained in the previous two years. It should be noted that only about 11,000 of the highest quality scientific journals have the impact factor, and any journal with impact factor can be considered as very prestigious. All impact journals can be found in Journal Citation Reports ([http://thomsonreuters.com/journal-citation-reports/).](http://thomsonreuters.com/journal-citation-reports/))

The impact factor formula:

**Number of citations in year X for articles published in years X-1 and X-2**

**IF = ---------------------------------------------------------------------------------**

**Number of articles published in the journal in years X-1 and X-2**



Figure 4 - Impact factor development of journal Politická ekonomie (“InCites Journal Citation Reports”, 2018)

**Eigenfactor** – consists of practically two indicators:

1. **Eigenfactor Score** - is an estimate of the percentage of time that users spend with a given journal. The sum of the values of all journals is equal to 100. It is clear that with the number of scientific journals included, this figure is very small for most journals.
2. **Article Influence Score** – this value indicates the average rate of impact of articles from a particular journal within the first five years after their publication. The higher the number, the more prestigious the source journal is. Simply put, citation in a prestigious journal has more weight than those published in an average or below average journal. The Article Influence Score is used by the new Methodology of R&D evaluation in the Czech Republic.

For more information visit: <http://www.eigenfactor.org/>

## 10.2 Citation metrics used by the Scopus database

SJR - SCimago Journal Rank is an indicator developed by the SCimago Research Group. The SJR calculation is based on a very complex algorithm. The aim of this indicator is to enable a relevant comparison of scientific journals in various fields with different citation approach (as it is a well-known fact that every scientific discipline has a different research methodology and therefore also different amount of cited materials). When determining the SJR, the prestige of journals in which citations of the analysed title appear is also considered.

SNIP - the SNIP indicator is a product of the Dutch University of Leiden. This indicator evaluates the citation data of journals by individual scientific fields.

IPP - Impact per Publication. This new indicator measures the citation influence of articles from the source journals over the last three years.

CiteScore - this is the latest indicator that actually represents a family of eight sub-indicators. CiteScore itself is very similar to Impact Factor, except that the period for its calculation is three previous years (with Impact Factor it is two previous years).

Information about indicators used in the Scopus database can be found on the portal: <http://www.journalmetrics.com/>.

# ASSESSMENT OF QUALITY OF PUBLICATION ACTIVITY For ONE AUTHOR (H - INDEX)

The so-called **Hirsch Index** (abbreviated as h-index) is a generally recognised indicator that evaluates publishing activity of individual authors. It is calculated based on data from the Web of Science and Scopus citation indexes. E.g. the h-index of the author is equal to the value of 4 if their fourth most cited article has received 4 or more citations.

*Example:*

• Article A - 15 citations

• Article B - 10 citations

• Article C - 5 citations

• Article D - 4 citations

• Article E - 2 citations

The h-index has a value of 4 because 4 articles of the author have been cited at least 4 times. The fifth most popular article has only received two citations, and for this reason it is below the imaginary line.

The data regarding the h-index of an author are important. For example, when applying for scientific grants the grant provider often evaluates the quality of the author according to their h-index.

The h-index also has its obvious weaknesses. Beginning authors who have not yet produced enough articles are somewhat disadvantaged by this measure, and so are authors who focus on quality over quantity and produced only a few articles but with a high citation count. However, their h-index is still low.

Other indicators that evaluate the author´s publication activity are more sophisticated such as the G-Index and, on the contrary, a rather simple I10-Index. The latter was developed as part of Google Scholar services. It is a number of articles written by an author whose citation count exceeded 10 citations (“Measuring your research impact: Author Impact”, 2018).

# ADVANCED INSTRUMENTS FOR QUALITY ASSESSMENT OF PUBLIcation ACTIVITIES

In addition to citation analyses that are available to Web of Science and Scopus users, there are other services evaluating the quality of publication results using other advanced indicators. Similar products can help eliminate inter-disciplinary differences in citation counts as it is known that in the social sciences it is customary to cite far less than in the natural sciences, etc. These paid analytical tools can provide other valuable information for example in the field of international cooperation, the proportion of highly cited articles, citation counts in the most prestigious journals, but also the rate of autocitations.

## Traditional evaluation tools

SciVal (<http://www.scival.com/)>- the company Elsevier product, which implements the source data from the Scopus database and then complements it with further useful analytical information. Probably the most important indicator here is the Field Weighted Citation Impact which compares the citation of individual articles or authors with the average in a certain scientific field. The metrics that are part of SciVal are described in detail in the so-called Snowball Metrics ([http://www.snowballmetrics.com/).](http://www.snowballmetrics.com/))

InCites (<http://researchanalytics.thomsonreuters.com/incites/)>- a very similar product is Clarivate Analytics´ InCites service. Here, the data is logically taken from the Web of Science database and, as with SciVal, a number of advanced metrics not available in the standard version of Web of Science is added.

## Alternative assessment systems

Both of the above products evaluate the quality of publication outputs based on citations. In recent years, however, there have been calls for publications to be evaluated more comprehensively. Citation analyses fail to effectively evaluate new publications that have not yet had enough time to collect citations. This is why, the Altmetrics initiative, which is the acronym of Article Level Metrics, emerged. Its publication rating is multi-layered and besides citations, is takes into account the number of downloads, the social media coverage (twitter, facebook, etc.) and blogs, or the number of downloads by the citation managers (Priem, Taraborelli, Groth, & Naylor, 2010). The following services work this way:

Altmetrics (<http://www.altmetric.com/)>- offers a wider range of services, some of which are available for free, while others are paid. Altmetrics indicators can be used, for example, for articles in institutional repositories, in discovery systems, and so on. Databases and electronic journal providers have started to integrate them into their services.



Figure 5 - Altmetrics.com metrics demonstration (Harvey, 2015)

PlumX (https://plu.mx/) - this sophisticated system has recently been acquired by the company Elsevier who now offers it to its customers. PlumX is available under a commercial license and can evaluate the impact of different types of publications. Besides articles, it also evaluates presentations, books, videos, etc. Indicators divided into five main categories (usage, citation, mentions, social media and captures) are assigned to individual documents. Researchers thus receive a comprehensive feedback on the real impact of their publications, practically immediately after their publication.

Bookmetrix (<http://www.bookmetrix.com/>) - a rather interesting product of the Springer Publishing House, developed in collaboration with Altmetrics. It is a system that is primarily focused on the publication impact of books. Its current limitation is the fact that it generates indicators only for publications of the Springer Publishing House itself. In principle, it is a product similar to the two above mentioned services. A publishing impact of books is evaluated according to several different criteria (namely downloads, citations, reviews, mentions and readers).

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# UNIQUE IDENTIFIers of researcher

With the number of scientific journals and articles rising, and with bibliographic databases (particularly citation indexes) offering information systems with tens of millions of records, the issue of author identification has emerged. It often happens that a name and surname may be the same for several individuals. Also, transcription of names in foreign databases may often be very problematic, etc. Therefore, authors are strongly encouraged to create their own unique identifiers that would make it possible to keep up-to-date author profiles that can be linked to key Web of Science and Scopus databases. Such unique identifiers in these databases guarantee a more relevant results.

Specific systems:

## 13.1 ResearcherID

ResearcherID (<http://www.researcherid.com/)> - after a free registration in the system, the author is assigned a unique identification code. They can then upload current articles to their profile and link these to Web of Science. The product belongs to Clarivate Analytics and its significant limitation is the fact that the use of the identifier is limited to the Web of Science database only. Therefore, there has recently been a stronger tendency towards the ORCID identifier, which has a much wider use. Interestingly, the ResearcherID and ORCID identifiers can be linked together.

## 13.2 ORCID

ORCID (<http://orcid.org/)>- ORCID is a newer and more universal service available free of charge. In addition to the fact that the profile can be directly linked to the Scopus database, ORCID identifiers are also required by the publishers of professional journals, i.e., the author´s name as well as the ORCID code is requested. The interactive ORCID icon is often seen in the paper headline of various publishers.

The TBU Library in Zlín offers researchers maintenance of both their ResearcherID and ORCID profiles. Especially for the ORCID code, it entails a wider set of services. For example, you can enable an application that connects an institutional repository with ORCID. In practice this means that when uploading an article to the repository, this article is immediately and automatically transferred or linked to the author´s ORCID profile. More information can be found here: <https://knihovna.utb.cz/veda-a-vyzkum/identifikatory-autora/>.

There are other identifiers over which however the authors do not have a full control. One of them is **ScopusID**. The Scopus database (unlike Web of Science) creates unique identifiers, for individual scientists and for their home institutions. The ScopusID identifier is machine-generated, and occasionally the same author is assigned several identifiers. The reasons may be different diacritics or the order of name and surname, etc. In such a case, Scopus must be informed of this fact and correction requested. Again, it is possible (or perhaps advisable) to ask the library for help.

As already mentioned, there are also clear identifiers at the level of individual scientific institutions. Nowadays, it is a very accentuated matter as identification of institutions, or their components (faculties, institutes, etc.) is essential for proper document linking. The Scopus database creates own **AffiliationID** for each institution. This should help include all documents produced by authors affiliated with the organisation into the database. Realistically, it is possible that several AffiliationIDs were generated for a single institution. Similarly, it is common for some articles from the institution to be assigned an incorrect AffiliationID. The reason is a certain creativity of authors of articles who make up names for their institutions, often very original names, that Scopus algorithm is not able to identify and automatically creates a new unique AffiliationID. It is a tall order for the institution´s librarians to keep the data records in the correct form. Otherwise, the institution loses a part of its production along with points in different rankings and ranking systems. **GRID** (<https://www.grid.ac/>) is a specialised database, which focuses on unique identification of individual organisations.

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# ACADEMIC SOCIAL NETWORKS AND PLATFORMs FOR DISSEMINATION OF PUBLICATION OUTPUTS

Social networks have become a phenomenon in everyday life. This trend has not avoided the scientific and research sphere. In fact, communicating with colleagues, searching for research partners, or sharing one´s publications with the professional public is a standard part of a scientist´s life. For this reason, social networks for scientific area have been developed and academics frequently use these for the reasons listed above, among other things. In some cases, these services are also supported by commercial publishers, as the publishing activity of authors gains more visibility on modern platforms and can thus increase the citability of individual articles, which helps to increase prestige of the source journal. On the other hand, dissemination of articles through social networks has recently become a somewhat unsafe phenomenon. Several prominent publishers have taken legal action to prevent such dissemination of their publications. In particular, the services of ResearchGate and AcademiaEdu (Chawla, 2017) belonged to those affected ones. Nonetheless, academic social networks are still enjoying great popularity. The most famous services of this type include:

**ResearchGate** (<http://www.researchgate.net/)>

**AcademiaEdu** (<http://www.academia.edu/)>

**Mendeley** (<http://www.mendeley.com/)>

These three services are classic social networks, of course with a number of specialised tools. ResearchGate, for example, calculates the citation score of publications for individual authors; Mendeley is also a platform for converting documents into various citation styles. Other services are even more distinctive.

**ImpactStory** (https://impactstory.org/)

**Kudos** (https://[www.growkudos.com/)](http://www.growkudos.com/))

ImpactStory and Kudos are services that help authors make their publications more visible. The authors have their personal profiles here with a lot of additional information about themselves and a number of interesting metrics and user statistics. The articles are presented in detail to the academic (but also laic) community. Typically, links to legal downloads are available here.

**FigShare** (<http://figshare.com/)>

FigShare is a very popular service that continues to grow dynamically. Compared to the platforms above, it has a unique advantage - it is also a data repository. Thus, it is possible to insert accompanying material for individual articles in the form of a variety of datasets. The practice of providing similar access to scientific publications has been adopted by many renowned institutions which use the service of the **FigShare for Institutions** (<https://figshare.com/services/institutions>). It is particularly beneficial for scientific organisations because they do not need to create their own data repositories. A similar service is called the **DRYAD** data repository (https://datadryad.org/).

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SUMMARY

The chapters above should provide the readers, primarily students of doctoral study programmes at the Faculty of Management and Economics at TBU in Zlín, with sufficient theoretical knowledge in the field of information resources, and with a basic overview of practices and procedures of scientific publication. Needless to say that the process of publishing scholarly articles and other materials must be experienced practically. This learning aid is to instruct and guide the students to use the information resources correctly and help in their own subsequent publication processes. However, the research itself, the choice of the topic, and its correct processing is fully within the competence of the author, i.e., it depends solely on the author how successful they will be when publishing their research findings. It is my hope, that this material serves as a valuable tool in the process.

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