How to format your paper for *Educational Dimension*

Serhiy O. Semerikov[1,2,3,4][0000−0003−0789−0272],
Vita A. Hamaniuk[1][0000−0002−3522−7673], and
Arnold E. Kiv[5][0000−0002−0991−2343]

[1] Kryvyi Rih State Pedagogical University, 54 Gagarin Ave., Kryvyi Rih, 50086, Ukraine
semerikov@ccjournals.eu, vitana65@gmail.com
https://kdpu.edu.ua/semerikov
https://kdpu.edu.ua/personal/vagamanuk.html
[2] Kryvyi Rih National University, 11 Vitalii Matusevych Str., Kryvyi Rih, 50027, Ukraine
[3] Institute for Digitalisation of Education of the NAES of Ukraine, 9 M. Berlynskoho Str., Kyiv, 04060, Ukraine
[4] University of Educational Management, 52A Sichovykh Striltsiv Str., Kyiv, 04053, Ukraine
[5] Ben-Gurion University of the Negev, P.O.B. 653, Beer Sheva, 8410501, Israel
kiv@bgu.ac.il
https://ieeexplore.ieee.org/author/38339185000

Abstract. A clear and well-documented LaTeX document is presented as an article formatted for publication in the *Educational Dimension*. Based on the "llncs" document class, this article presents and explains many of the common variations, as well as many of the formatting elements an author may use in the preparation of the documentation of their work.

Keywords: LaTeX class · paper template · paper formatting

1 On the LaTeX

You can freely use any LaTeX compatible typesetting system (e.g., TeXStudio + TexLive is a good choice for any operating systems), but if you don't to be involved into the LaTeX system administration, we propose to use a cloud based LaTeX editors like Overleaf (www.overleaf.com). After registering at www.overleaf.com, you can start your paper revision with this template using 'New Project' – 'Upload Project' menu (figure 1).

The next step is to select the template archive (figure 2).

To get a camera-ready version of your paper in PDF, you can click to 'Download PDF' icon or use 'Menu' to download both LaTeX source files (ZIP) and camera-ready version (PDF) (figure 3).

The most-often recommended tutorial is the "(Not So) Short Guide to LaTeX2ε" (https://www.ctan.org/tex-archive/info/lshort/).

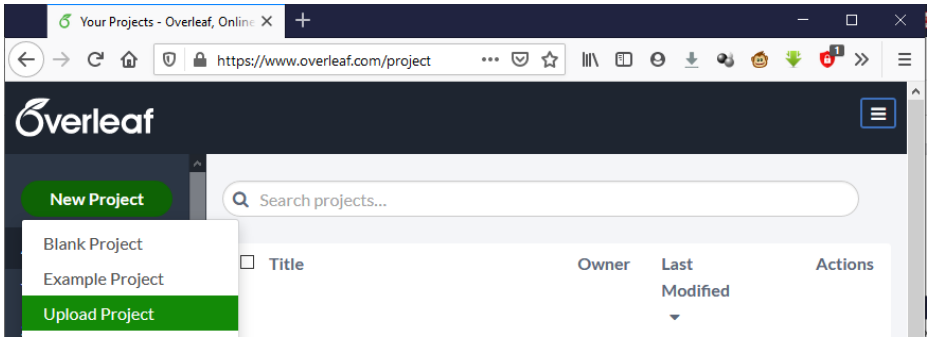

Fig. 1. How to upload your project to Overleaf.

2 On the template

`llncs` article template provides a consistent LaTeX style for use across publications, and incorporates accessibility and metadata-extraction functionality. The `llncs` class is an extension of the standard LaTeX `llncs` class. Therefore you may use all article commands in your manuscript.

This document will explain the major features of the document class. You can use this document as the template for preparing your publication. We recommend using the latest version of the `llncs` style (https://www.springer.com/gp/computer-science/lncs/conference-proceedings-guidelines).

If you are new to publishing with *Educational Dimension*, this document is a valuable guide to the process of preparing your work for publication.

The "`llncs.cls`" document class can be used to prepare articles for any *Educational Dimension* publication, and for any stage of publication, from review to final "camera-ready" copy with *very* few changes to the source.

The `splncs04.bst` BibTeX bibliography style is intended for use in preparing manuscripts for *Educational Dimension*. It provides numeric citation with Harvard-like formatting.

3 Modifications

Modifying the template — including but not limited to: adjusting margins, typeface sizes, line spacing, paragraph and list definitions, and the use of the `\vspace` command to manually adjust the vertical spacing between elements of your work — is not allowed.

4 Paper language

The main language of *Educational Dimension* is English. The paper text can be in English, German, Russian or Ukrainian. In any case, the article title, abstract and keywords must be in English only.

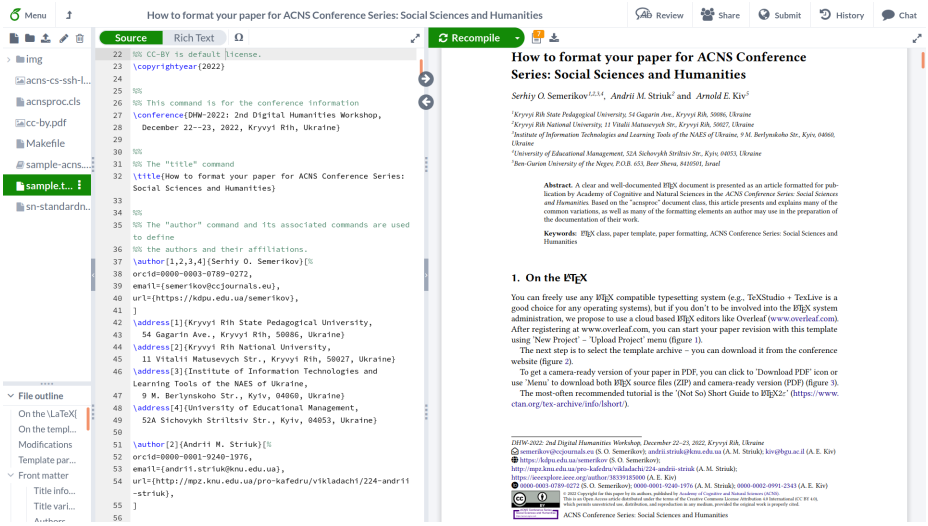

Fig. 2. Overleaf, online LaTeX editor.

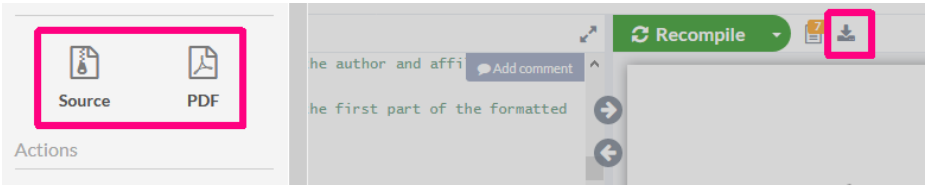

Fig. 3. How to download your project from Overleaf.

You should enable the Babel package for proper hyphenation if your paper is not in English. For papers in Ukrainian use

```
\usepackage[english, ukrainian]{babel}
```

Recall that the language enlisted last in the list of options of the babel package is assumed to be the main language of the document, which is also active language right after `\begin{document}`.

5 Front matter

5.1 Title information

The titles of papers should all use the regular English style: the first letter of the title should be capitalized with the rest in lower case.

Use the `\title` command to define the title of your work. Do not insert line breaks in your title.

Please be ensured that the title, abstracts and keywords for each submitted paper are strictly in English.

An optional subtitle may also be added:

```
\subtitle{<subtitle of your contribution>}
```

5.2 Authors and affiliations

Each author must be defined separately for accurate metadata identification. Multiple authors may share one affiliation. Authors' names should not be abbreviated; use full first names wherever possible. Include authors' e-mail addresses whenever possible. ORCID iDs are mandatory.

The name(s) of the author(s) are specified by:

```
\author{<author(s) name(s)>}
```

If there is more than one author, please separate them by `\and`. This makes sure that correct punctuation is inserted according to the number of authors.

Numbers referring to different addresses or affiliations should be attached to each author with the `\inst{<number>}` command. If an author is affiliated with multiple institutions the numbers should be separated by a comma, for example `\inst{2,3}`.

ORCID identifiers should be included with

```
\orcidID{<ORCID identifier>}
```

The ORCID (Open Researcher and Contributor ID) registry provides authors with unique digital identifiers that distinguish them from other researchers and help them link their research activities to these identifiers. Authors who are not yet registered with ORCID are encouraged to apply for an individual ORCID id at https://www.orcid.org and to include it in their papers.

If you have done this correctly, the author line now reads, for example:

```
\author{First Author\inst{1}\orcidID{0000-1111-2222-3333} \and
Second Author\inst{2,3}\orcidID{1111-2222-3333-4444}}
```

The given name(s) should always be followed by the family name(s). Authors who have more than one family name should indicate which part of their name represents the family name(s), for example by non-breaking spaces
`Jos\'{e} Martinez~Perez`
or curly braces
`Jos\'{e} {Martinez Perez}`.

As given name(s) are to be shortened to initials in the running heads, specifying an abbreviated author list with the optional command:

```
\authorrunning{<abbreviated author list>}
```

might add some clarity about the correct representation of author names in the running-heads.

Addresses of institutes, companies, etc. should be given in `\institute`. Multiple affiliations are separated by `\and`, which automatically assures correct numbering:

```
\institute{<name of an institute>
\and <name of the next institute>
\and <name of the next institute>}
```

Inside ou can use

```
\email{<email address>}
```

and

```
\url{<url>}
```

to provide author email addresses and Web pages. If multiple authors have the same affiliation, please check that the order of email addresses matches the sequence of (affiliated) author names.

5.3 Format the header

The command `\maketitle` formats the header of your paper. If you leave it out the work done so far will produce *no* text.

5.4 Abstract and keywords

Abstract shall be entered in an environment that starts with `\begin{abstract}` and ends with `\end{abstract}`.

```
\begin{abstract}
  This is an abstract.
\end{abstract}
```

Keywords should be specified inside the abstract environment. Please separate keywords with `\and`:

```
\keywords{first keyword \and second keyword \and third keyword}
```

The keyword separator will then be properly rendered as a middle dot.

6 Sectioning commands

Your work should use standard LaTeX sectioning commands:
`\section`, `\subsection`, `\subsubsection`, and `\paragraph`.
They should be numbered; do not remove the numbering from the commands.

Simulating a sectioning command by setting the first word or words of a paragraph in boldface or italicized text is not allowed.

7 Tables

Tables should be numbered sequentially throughout the text and referred to in the text by number (table 1, etc, **rather than** tab. 1). Each table should be a float and be positioned within the text at the most convenient place near to where it is first mentioned in the text. It should have an explanatory caption which should be as concise as possible. Table captions are placed *above* the table.

Because tables cannot be split across pages, the best placement for them is typically the top of the page nearest their initial cite. To ensure this proper "floating" placement of tables, use the environment `table` to enclose the table's contents and the table caption. The contents of the table itself must go in the `tabular` environment, to be aligned properly in rows and columns, with the desired horizontal and vertical rules.

Immediately following this sentence is the point at which table 1 is included in the input file; compare the placement of the table here with the table in the printed output of this document.

Table 1. Frequency of special characters.

Non-English or Math	Frequency	Comments
Ø	1 in 1,000	For Swedish names
π	1 in 5	Common in math
\$	4 in 5	Used in business
Ψ_1^2	1 in 40,000	Unexplained usage

You can find a lot of examples at *Overleaf documentation on tables*.

8 Math equations

You may want to display math equations in three distinct styles: inline, numbered or non-numbered display. Each of the three are discussed in the next sections.

Equations may be numbered sequentially throughout the text (i.e., (1), (2), (3), ...) or numbered by section (i.e., (1.1), (1.2), (2.1), ...) depending on the author's personal preference. In articles with several appendices equation numbering by section is useful in the appendices even when sequential numbering has been used throughout the main body of the text: for example, A.1, A.2 and so forth. When referring to an equation in the text, always put the equation number in brackets – e.g. 'as in equation (2)' or 'as in equation (2.1)' – and always spell out the word 'equation' in full, e.g. 'if equation (5) is factorized'; do not use abbreviations such as 'eqn.' or 'eq.'.

8.1 Inline (in-text) equations

A formula that appears in the running text is called an inline or in-text formula. It is produced by the `math` environment, which can be invoked with the usual

`\begin` ... `\end` construction or with the short form `$` ... `$`. You can use any of the symbols and structures, from α to ω; this section will simply show a few examples of in-text equations in context. Notice how this equation: $\lim_{n\rightarrow \infty} \frac{1}{n} = 0$, set here in in-line math style, looks slightly different when set in display style. (See next subsection).

8.2 Display equations

A numbered display equation – one set off by vertical space from the text and centered horizontally – is produced by the `equation` environment. An unnumbered display equation is produced by the `displaymath` environment (or `equation*` with `amsmath` package).

Again, in either environment, you can use any of the symbols and structures available in LaTeX; this section will just give a couple of examples of display equations in context. First, consider the equation, shown as an inline equation above:

```
\begin{equation}
\lim_{n\rightarrow \infty} \frac{1}{n} = 0.
\end{equation}
```

$$\lim_{n\rightarrow \infty} \frac{1}{n} = 0. \tag{1}$$

Notice how it is formatted somewhat differently in the `displaymath` environment. Now, we'll enter an unnumbered equation:

```
\begin{displaymath}
S_{n} = \sum_{i=1}^{n} x_{i} ,
\end{displaymath}
```

$$S_n = \sum_{i=1}^{n} x_i,$$

and follow it with another numbered equation:

```
\begin{equation}\label{lim}
\lim_{x \to 0} (1 + x)^{1/x} = e
\end{equation}
```

$$\lim_{x\to 0} (1+x)^{1/x} = e \tag{2}$$

just to demonstrate LaTeX's able handling of numbering.

Usually, equations should be centred and should be numbered with the number on the right-hand side. (You can find an additional examples of alignment at *Overleaf documentation on aligning equations with amsmath*).

Using `\label{equation}` you can refer to corresponding equation (e.g., equation (2)) by number.

9 Figures

Figures must be included in the source code of an article at the appropriate place in the text not grouped together at the end.

Each figure should have a brief caption describing it and, if necessary, interpreting the various lines and symbols on the figure. As much lettering as possible should be removed from the figure itself and included in the caption. If a figure has parts, these should be labelled (a), (b), (c), etc.

Authors should try and use the space allocated to them as economically as possible. Place the figure as close as possible after the point where it is first referenced in the text. If there are a large number of figures it might be necessary to place some before their text citation. Figures should never appear within or after the reference list.

Individual figures should normally be centred but place two figures side-by-side if they will fit comfortably like this as it saves space. At times it may be convenient to put two figures side by side or the caption at the side of a figure. To put figures side by side, within a figure environment, put each figure and its caption into a minipage with an appropriate width (e.g. 3in or 18pc if the figures are of equal size) and then separate the figures slightly by adding some horizontal space between the two minipages (e.g. `\hspace{.2in}` or `\hspace{1.5pc}`. To get the caption at the side of the figure add the small horizontal space after the `\includegraphics` command and then put the `\caption` within a minipage of the appropriate width aligned bottom, i.e. `\begin{minipage}[b]{3in}` etc.

The "`figure`" environment should be used for figures. One or more images can be placed within a figure.

Your figures should contain a caption which describes the figure to the reader (see figure 6). Figure captions go below the figure. Your figures should also include a description suitable for screen readers, to assist the visually-challenged to better understand your work.

For figures with fixed position in text use syntax of figure 6:

```
\begin{figure}[h]
\centering
\includegraphics[width=0.75\linewidth]{img/example-franklin}
\caption{1907 Franklin Model D roadster.}
\label{fig-0}
\end{figure}
```

If a figure has parts these should be labelled as (a), (b), (c) etc on the actual figure. Parts should not have separate captions (see figure 7).

```
\begin{figure}[t]
\begin{center}
\begin{minipage}[b]{0.47\columnwidth}
\includegraphics[width=1\columnwidth]{img/name.eps}
\begin{center}(a)\end{center}
\end{minipage}
```

Fig. 4. Figure caption for first of two sided figures.

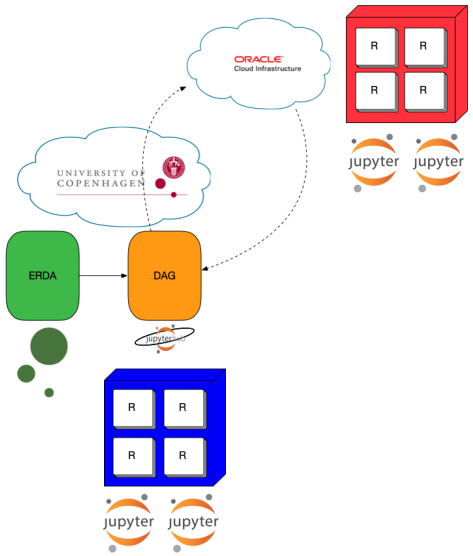

Fig. 5. Figure caption for second of two sided figures.

```
\hspace{0.04\columnwidth}
\begin{minipage}[b]{0.47\columnwidth}
\includegraphics[width=1\columnwidth]{img/name.eps}
\begin{center}(b)\end{center}
\end{minipage}
\end{center}
\caption{\label{fig5}A caption of figure of two parts, (a) and (b).}
\end{figure}
```

9.1 Colour illustrations

You are free to use colour illustrations.

Remark Use over 300 dpi resolution for your figures (we prefer 600 dpi).

One more remark Don't use the lossy compressed images (e.g., JPEG).

10 Citations and bibliographies

References should be cited in the text by placing sequential numbers in brackets using `\cite` (for example, [9, 23, 30, 33, 44, 53, 60]) and `\citet` (for example, Osadcha and Osadchyi [33], Spirin [53], Vakaliuk et al. [60]). A complete reference

Fig. 6. 1907 Franklin Model D roadster.

should provide enough information to locate the article. The terms *loc. cit.* and *ibid.* should not be used.

Unpublished conferences and reports should generally not be included in the reference list and articles in the course of publication should be entered only if the journal of publication is known.

A thesis submitted for a higher degree may be included in the reference list if it has not been superseded by a published paper and is available through a library; sufficient information should be given for it to be traced readily.

10.1 Formatting reference lists

The use of BibTEX for the preparation and formatting of one's references is **mandatory**.

You should specify bibliography style `splncs04`. References will then be sorted and formatted in the correct style.

```
\bibliographystyle{splncs04}
```

The bibliography is included in your source document with this command, placed just before the `\end{document}` command:

```
\bibliography{bibfile}
```

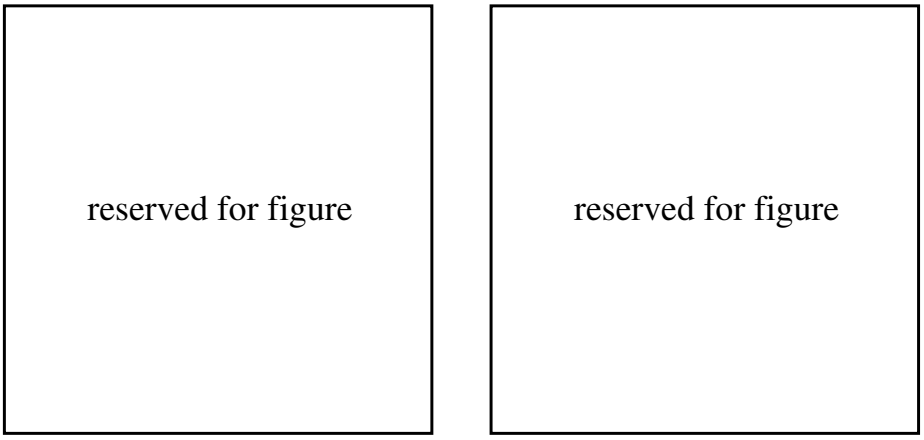

Fig. 7. A caption of figure of two parts, (a) and (b).

where "`bibfile`" is the name, without the "`.bib`" suffix, of the BibTEX file.

11 Bibliographic data fields

11.1 References to printed journal articles

A normal reference to a journal article is constructed as follows:

```
@article{Osadchyi2017133,
author={Osadchyi, V. and Osadcha, K. and Eremeev, V.},
title={The model of the intelligence system for the analysis
of qualifications frameworks of {European} countries},
journal={{International Journal of Computing}},
year={2017},
volume={16},
number={3},
pages={133-142},
doi={10.47839/ijc.16.3.896}
}
```

11.2 References to books, conference proceedings and reports

References to books, proceedings and reports are similar to journal references:

– Complete book

```
@book{Morkun,
author = {Vladimir Morkun and Serhiy Semerikov
and Svitlana Hryshchenko},
title = {Methods of Using Geoinformation  Technologies
in Mining  Engineers' Training},
year = {2018},
publisher = {Cambridge Scholars Publishing},
address = {Newcastle upon Tyne},
url={https://www.cambridgescholars.com/product/978-1-5275-1615-1}
}
```

– Book in series

```
@book{Dirac:1958,
author = {P. A. M. Dirac},
title = {The Principles of Quantum Mechanics},
series = {The International Series of Monographs on Physics},
number = {27},
edition = {4},
publisher = {Clarendon Press},
address = {Oxford},
year = {1967}
}
```

– Book chapter or some part of book

```
@inbook{Humboldt:ch1,
publisher = {Cambridge University Press},
year = {1999},
title = {{On Language: On the Diversity of Human Language
 Construction and its Influence on the Mental Development
 of the Human Species}},
series={{Cambridge Texts in the History of Philosophy}},
author = {Wilhelm {Von Humboldt}},
editor={Michael Losonsky},
chapter={1},
pages={11-22},
}
```

(You can also cite any part of book using `\cite[pp.~110--113]{Dirac:1958}` or `\cite[chapter 4, pp.~98--105]{Dirac:1958}`)

– Authored chapter

```
@Incollection{Shramko2016,
author="Shramko, Yaroslav",
editor="Bimb{\'o}, Katalin",
title={{Truth, Falsehood, Information and Beyond:
       The American Plan Generalized}},
```

```
bookTitle={{J. Michael Dunn on Information Based Logics}},
year="2016",
publisher="Springer International Publishing",
address="Cham",
pages="191--212",
isbn="978-3-319-29300-4",
doi="10.1007/978-3-319-29300-4_11",
}
```

– Article in conference proceedings

```
@incollection{Tkachuk2021,
author="Tkachuk, Viktoriia and Yechkalo, Yuliia and
Semerikov, Serhiy and Kislova, Maria and Hladyr, Yana",
editor="Bollin, Andreas and Ermolayev, Vadim
and Mayr, Heinrich C. and Nikitchenko, Mykola
and Spivakovsky, Aleksander and Tkachuk, Mykola
and Yakovyna, Vitaliy and Zholtkevych, Grygoriy",
title="{Using Mobile ICT for Online Learning
        During COVID-19 Lockdown}",
doi={10.1007/978-3-030-77592-6_3},
booktitle="Information and Communication
Technologies in Education,  Research,
and Industrial Applications",
year="2021",
publisher="Springer International Publishing",
address="Cham",
pages="46--67",
isbn="978-3-030-77592-6"
}
```

or `@conference` or `@inproceedings`.

11.3 A case of non-Latin source

When non-Latin alphabet publication cited, the title of the publication (e.g., book or article) in the original language need to be both transliterated and translated in English. Other bibliographic components (including authors, publisher, address and journal name) are transliterated only [44]:

```
@article{IA2000,
author={Semerikov, S. O. and Soloviov, V. M. and
        Teplytskyi, I. O.},
year=2000,
title= {Instrumentalne zabezpechennia kursu kompiuternoho
modeliuvannia [{I}nstrumental support of the course of computer
modeling]},
```

```
journal= {Kompiuter u shkoli i simi},
number=4,
pages={28-31},
url={https://lib.iitta.gov.ua/704129/}
}
```

11.4 Best practices: export citations into a BibTEX file

A good way to make your bibliography is to exclude manual creation bibliography items whenever it possible. We strongly recommend to use the "Cite" (export) facilities to BibTEX which available in the most of OJS installations (figure 8a), ACM Digital Library (figure 8b), Scopus (figure 8c), IEEE Xplore (figure 8d), ScienceDirect (figure 8e), Web of Science (figure 8f) etc.

11.5 Some examples

A paginated journal article [23], an enumerated journal article [19, 45], a monograph (whole book) [30], a monograph/whole book in a series [13], a divisible-book such as an anthology or compilation [9] followed by the same example, however we only output the series if the volume number is given [10] (so series should not be present since it has no volume number), a chapter in a divisible book [52], a chapter in a divisible book in a series [8], a multi-volume work as book [24], an article in a proceedings (of a conference, symposium, workshop for example) (paginated proceedings article) [2, 28], a proceedings article with all possible elements [51], an informally published work [12], a doctoral dissertation [5], a master's thesis: [3], an online document / world wide web resource [1, 36, 56], a video game (Case 1) [32] and (Case 2) [31] and [27] and (Case 3) a patent [43], work accepted for publication [39]. Multi-volume works as books [16] and [15]. A couple of citations with DOIs: [17, 21]. Online citations: [4, 38, 56, 59].

A lot of citations with `\cite`: [6, 7, 11, 14, 18, 20, 22, 25, 26, 29, 34, 35, 37, 40–42, 46–50, 54, 55, 57, 58, 61–64].

Same citations with `\citet`: Descartes [6], Dirac [7], Goncharov et al. [11], Haveman and Gualtieri [14], Kalitkin and Kuz'mina [18], Kerley [20], Kiv et al. [22], Konoplya [25], Koryakova and Epimakhov [26], Morkun et al. [29], Osadchyi et al. [34], Plato [35], Puu and Sushko [37], Russell [40], Rutberg et al. [41], Saptsin and Soloviev [42], Semerikov et al. [46], Shramko [47, 48], Shramko and Rossman [49], Shramko and Wansing [50], Sutherland [54], Teplytskyi [55], Tkachuk et al. [57], Trius et al. [58], Vlasenko et al. [61], Von Humboldt [62], Zhaldak [63, 64].

Acknowledgements Identification of funding sources and other support, and thanks to individuals and groups that assisted in the research and the preparation of the work should be included in an acknowledgment section, which is placed in an unnumbered run-in heading (i.e. 3rd-level heading) just before the reference section in your document:

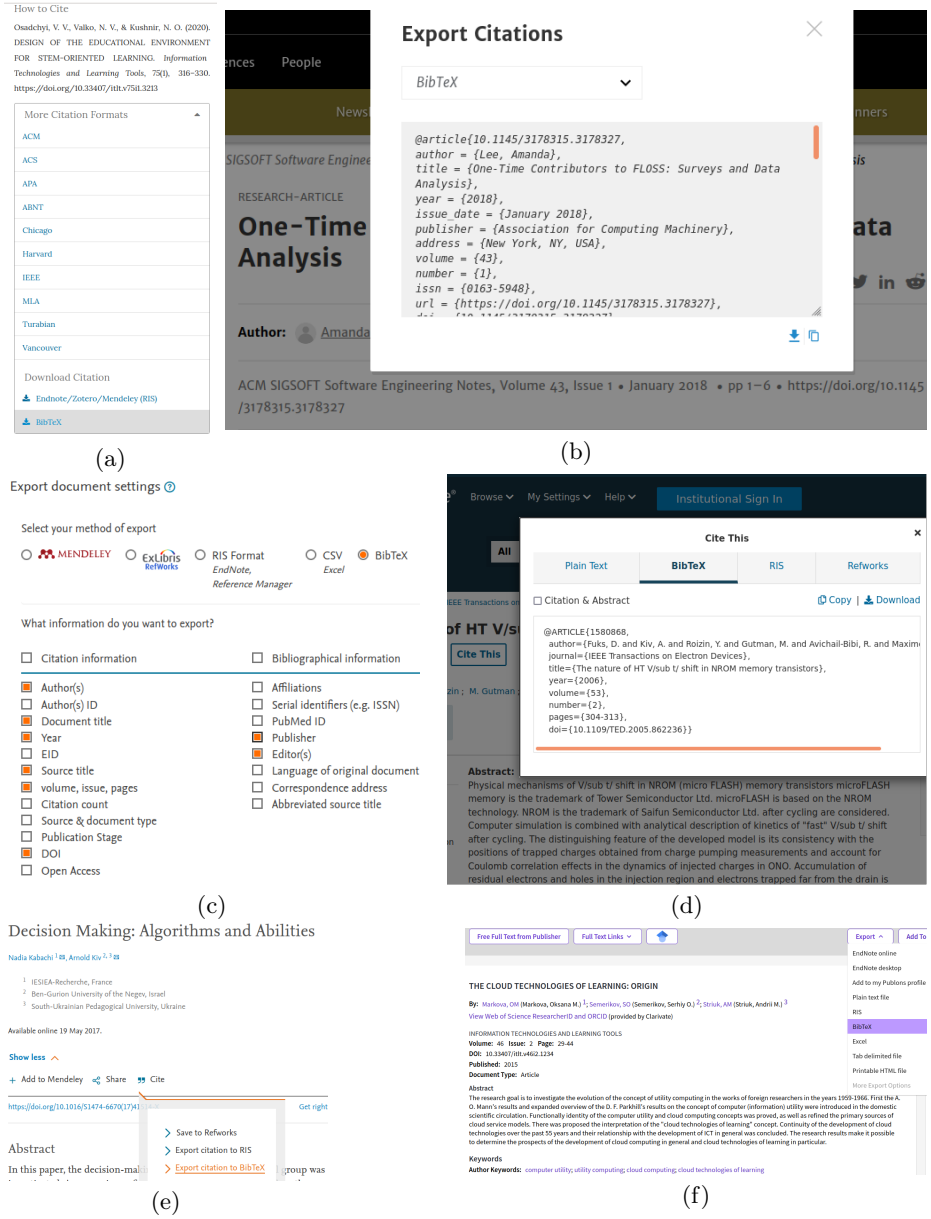

Fig. 8. Export citations into a BibTEX file.

```
\subsubsection{Acknowledgements} We acknowledge Covidpocalypse
2019 for making the long-awaited completion of this paper possible.
```

References

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A Appendix

If your work needs an appendix, add it before the "`\end{document}`" command at the conclusion of your source document.

Start the appendix with the "`\appendix`" command:

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and note that in the appendix, sections are lettered, not numbered.