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Research article

## Do it Yourself at YouTube

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### Abstract

Every person at least once in his life is faced with an instruction – a certain set of rules, which spells out how to use a household appliance, how to behave in a given situation, perform this or that type of work, and so on. It can be a multimodal text that describes the actions, the implementation of which should lead to a result. If earlier the text with illustrations served as the main form of instruction, nowadays there are video instructions. The modern name for video instructions is DIY video, the authors of which strive to convey to the viewer in a short period of time how to create some thing or tool on their own at home. The purpose of this article was to analyze DIY video as instructions for creating tools. More often than others on YouTube there are videos for creating a holder for a tool, a clamp and an attachment for an angle grinder, and the most difficult tool to create is a grinder. A comparative analysis of video instrumentation and magazine articles (using the example of creating a lathe, an electrolyzer and a collet holder for files) showed the difference between instructions in text format and video format. In a video of this format, the authors visually provide the viewer with information about the choice of material, the creation of a device, how to correct possible mistakes, how the viewer can improve and subsequently adapt the created device for himself. Based on the study, it was revealed that the information in the video is presented more clearly and contributes to understanding the essence of the process itself. However, due to the large amount of visual information, the reasons for doing certain technological operations are omitted. This prevents the viewer from realizing the essence of the actions, it will be more difficult for him to adapt to other conditions. Viewing the video is much easier, the viewer has the opportunity to step by step repeat all the actions of the author. However, in order to make changes to the design, come up with your own self-made products and refine them, you need to study and analyze several sources of information.

**Keywords:** DIY; Self-made tools; Visual information; Manufacturing process; Visualization; Information presentation

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Научная статья

## “Сделай это сам ” видео на YouTube

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### Аннотация

Каждый человек хотя бы раз в своей жизни сталкивается с инструкцией – неким сводом правил, в котором прописано то, как нужно пользоваться бытовым прибором, как вести себя в той или иной ситуации, выполнять тот или иной вид работы и так далее. Она может представлять собой мультимодальный текст, в котором описываются действия, выполнение которых должно привести к результату. Если раньше основной формой инструкции служил текст с иллюстрациями, то на современном этапе появляются видео-инструкции. Современное название видео-инструкций – DIY-видео, авторы которых стремятся донести до зрителя за небольшой промежуток времени то, как самостоятельно в домашних условиях создать какую-либо вещь или инструмент. Целью данной статьи является анализ DIY-видео, как инструкции по созданию инструментов. Чаще других на YouTube представлены ролики по созданию держателя для инструмента, струбины и насадки на углошлифовальную машину, а самым сложным из предлагаемых к созданию инструментов является гриндер. Сравнительный анализ видео-инструкций и журнальных статей (на примере создания токарного станка, электролизера и цангового держателя для надфилей) показал разницу между инструкциями в текстовом формате и видео формате. В видео подобного формата авторы визуально предоставляют зрителю информацию о выборе материала, создании прибора, исправлении допущенных ошибок, улучшении и адаптации созданного прибора под себя. В видео-формате информация представлена более наглядно и способствуют пониманию сути самого процесса. Однако, за счет большого количества визуальной информации опускаются причины, по которым делаются, те или иные технологические операции. Это мешает зрителю осознать суть действий, ему сложнее будет подстроиться под иные условия. Просмотр видео намного проще, так как у зрителя есть возможность пошагово повторять все действия автора. Однако, для того чтобы вносить изменения в конструкцию, придумывать свои самоделки и дорабатывать их необходимо изучить и проанализировать несколько источников информации.

**Ключевые слова:** DIY; Самодельный инструмент; Визуальная информация; Процесс изготовления; Самоделка; Визуализация; Подача информации

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Мы хотели бы выразить благодарность Дарье Сергеевне Быльевой, которая была наставником работы. Мы также хотели бы поблагодарить всех, принимавших участие в создании проекта, особенно Диану Якименко и Анастасию Козлову за помощь в подготовке и переводе информации.

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## INTRODUCTION

Due to the pandemic situation in recent years, people began to spend more time at home, engaging in various hobbies. They had time to go to long-forgotten workshops and garages. Every garage owner who has at least some tools has done something with his own hands at least once in his life. Many receive initial skills of manual work in schools, in technology clubs, or in the process of studying in colleges and vocational schools, and some knowledge is also provided in universities. The greatest influence on the development of the ability to work with hands comes from direct work at a construction site, in a shop, at a workbench, etc. But what do those who received bad grades for crafting at school, skipped classes at a university or college, or did not work in places where you need to make something yourself? Of course, these people will first visit the world's largest video hosting site YouTube to find videos in which the author will tell you in detail how to pursue a particular project. The problem is that no one checks such videos for accuracy, compliance with safety measures, correct operation of the tool, or for meeting other criteria. Sometimes the authors do not even show the manufacturing process, but only tell how they made it and show the finished product.

## METHODS

For this paper one hundred YouTube videos were analyzed that demonstrate how to make your own tools. The search for videos was carried out according to the queries: “DIY tool” and “homemade tool” in the YouTube search bar. Also considered were videos offered as recommended videos on the “Main” tab of the hosting site after watching the previous ones. The set of products presented in the recommended videos is very diverse, but it also includes videos on similar topics. For a more detailed analysis, three videos were highlighted, one of which devoted to the creation of a lathe at home, the second to an electrolyzer (a system is designed to separate the components of a compound or solution using an electric current), and the third to a so-called collet-holder, that is, a tool that serves as a holder for other tools (rasps or files). Three videos were compared to printed articles on similar topics, and diagrams were created to compare the way information is presented.

## LITERATURE REVIEW

Do-It-Yourself (DIY) can be defined as activities in which individuals engage raw and semi-raw materials and component parts to produce, transform, or reconstruct material possessions (Wolf & McQuitty, 2011). Frequently DIY is considered as an activity to improve one's own home, household, etc., only rarely as a creative (Bennett & Guerra, 2018; Spencer, 2008; Threadgold, 2018) or scientific activity (Sarpong et al., 2020).

When prefer to produce something themselves, their motives are sometimes economic (connected with availability and suitability of available goods) or to confirm a certain self-image (fulfillment provided by craftsmanship, empowerment, community



seeking, need for uniqueness) (Luckman, 2015; Rosenberg, 2011; Williams, 2008; Wolf & McQuitty, 2011).

Watson and Shove (2008) point out that DIY is a field in which the relation between tools, materials, and competence is plainly significant (p. 72). On the other hand, they neglect the extent to which people rely in their activities on the instructions that are used by them to organize their material resources in the modern world.

All over the world, the DIY phenomenon has been integrated into culture in a variety of activities. A bright example of the modern expression of DIY culture in Europe and the USA is the DIY & Household industry, represented by DIY construction and furniture stores such as IKEA, Leroy Merlin, Castorama, OBI, etc. The buyer is offered a wide selection of tools for repair, construction, and design for self-assembly of furniture and creating an interior from particular parts. In a certain sense, such practices are *bricolage*, that is, the creation of a new object from improvised elements of the natural or socio-cultural environment (Belhadi, 2014; Duncan, 2011).

It is simple to suppose that these manifestations of DIY culture appeared by the growth of demand for categories of goods for self-assembly. Many people have started to carry out their construction and creative ideas. The instruction can be defined as a form of written or oral set of guidelines on how to create a particular object (Rodionova, 2017). The instruction is a bridge between knowing and doing (Brass et al., 2017). Technical writing researchers today show interest in instructions created by non-experts for non-experts (Kimball, 2016; van Ittersum, 2014). After all, they are the mainstay for network users.

Moreover, the development of digital technologies has introduced some opportunities to improve DIY instructions. The most popular educational videos on YouTube are precisely those videos where the authors not only share information that could be learned from written instructions, but also clearly show the process and sequence of work. Most of the current research on instructional videos focuses on making them effective technical communication products, relying on the psychology of education and instructional design (Shroyer, 2019; van der Meij & van der Meij, 2013).

The main feature of a well-written DIY instruction should be the simplicity of its perception by a person with even the lowest level of skill in this sphere (Behnke et al., 2019). Video instruction standards are not well-organized enough (Mogull, 2014) and many communication strategies for printing instructions have been applied to video instructions (Morain & Swarts, 2012). However, the distribution area of DIY instructions falls mainly on internet resources, and among them the leading position is occupied by the video hosting site YouTube, since most users need to consider the so-called “visual” instruction rather than read the printed one because visualization of the process helps a person imagine how his work will look and what the result should look like. Selber (2010) argues that the internet generates new genres. Pflugfelder (2013) similarly argues that the genre of the tutorial is changing: “What we see in the video of the web application is a relatively new form that functions as a short guide rather than a complete guide, and often promotes the product by presenting it” (p. 133).



## PROVIDED IN THE VIDEOS OF DIY

Of interest is what kind of self-made products are presented in the videos. What exactly is it that people want and can create themselves in the modern world of the availability of almost any tool. We have divided the self-made products of all authors into hand-tools and the rest – power-tools and machine-tools (fig. 1). The most popular hand-tool has proven to be the tool-holder. This homemade product allows you to modify the factory tool and make it more convenient to use. The second most popular tool is the clamp, while a third group of tools makes up a total of 12% of the videos from our sample: thickness gauge, core and pipe bender.

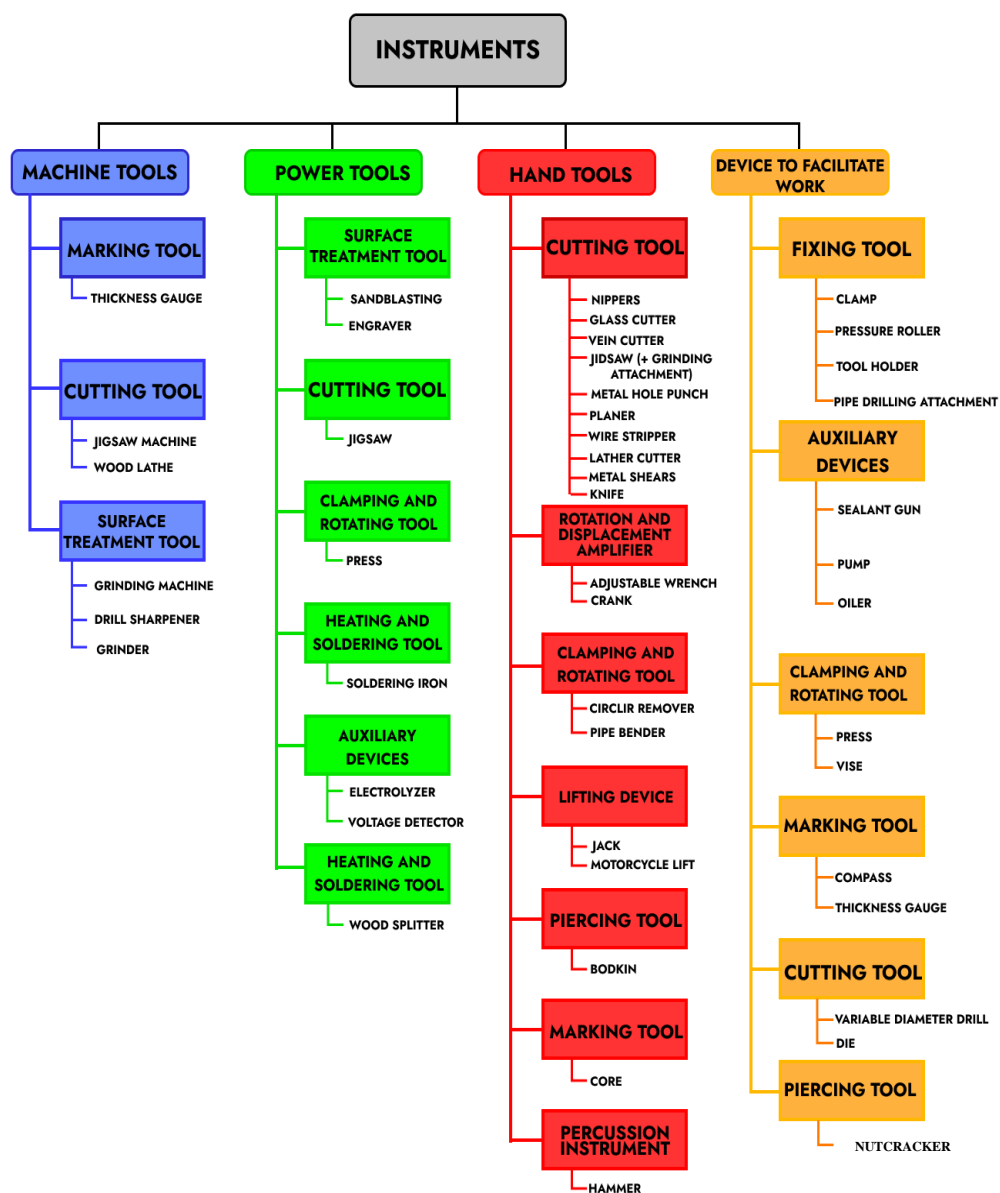
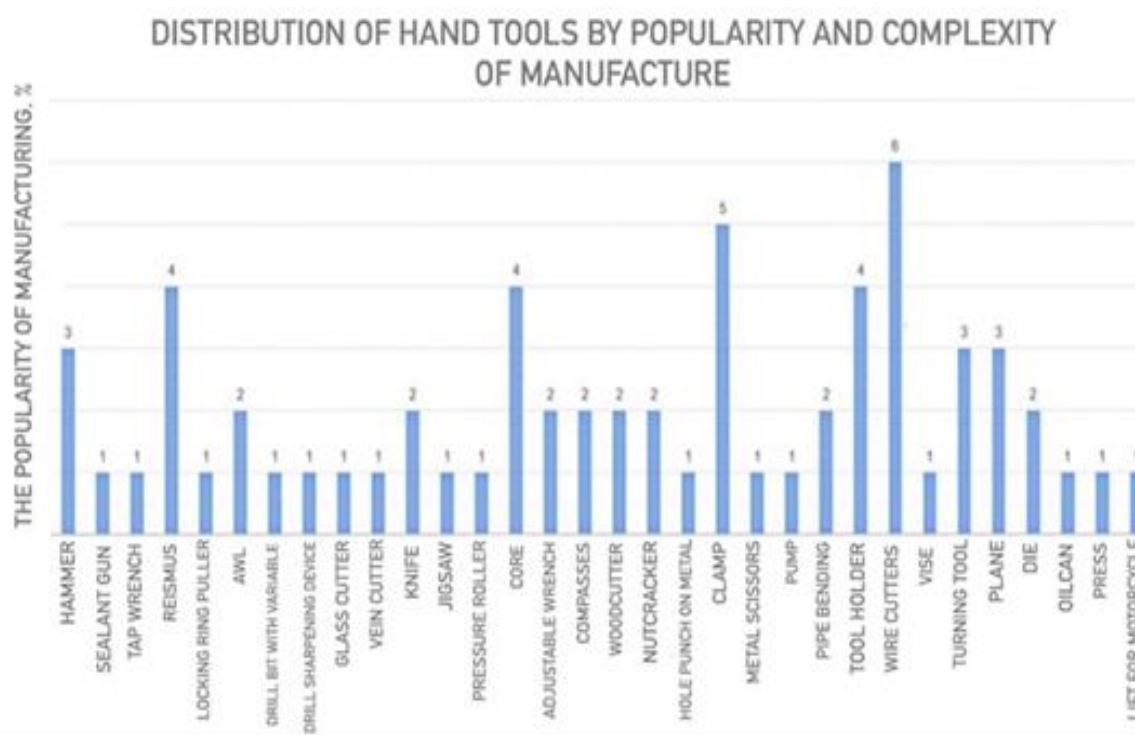


Figure 1. Classification of the tools presented in the videos



The following is the distribution of tools in order of increasing complexity of manufacturing (fig. 2), next to it is the percentage of videos in the total sample that are dedicated to this self-made product: Hammer – 3%; Sealant gun – 1%; Vorotok – 1%; Thickener – 4%; Retainer ring remover – 1%; Shiloh – 2%; Drill with variable diameter – 1%; Attachment for sharpening drills – 1%; Glass cutter – 1%; Wire cutter – 1%; Knife – 2%; Jigsaw – 1%; Pressure roller – 1%; Kern – 4%; Adjustable Wrench – 2%; Compasses – 2%; Wood splitter – 2%; Nutcracker – 2%; Puncher for metal – 1%; Clamp – 5%; Scissors for metal – 1%; Pump – 1%; Jack – 2%; Pipe bender – 4%; Tool holder – 6%; Nippers – 1%; Vice – 3%; Turning tool – 3%; Planer – 2%; Die – 1%; Oiler – 1%; Press – 1%; Motorcycle lift – 1%.



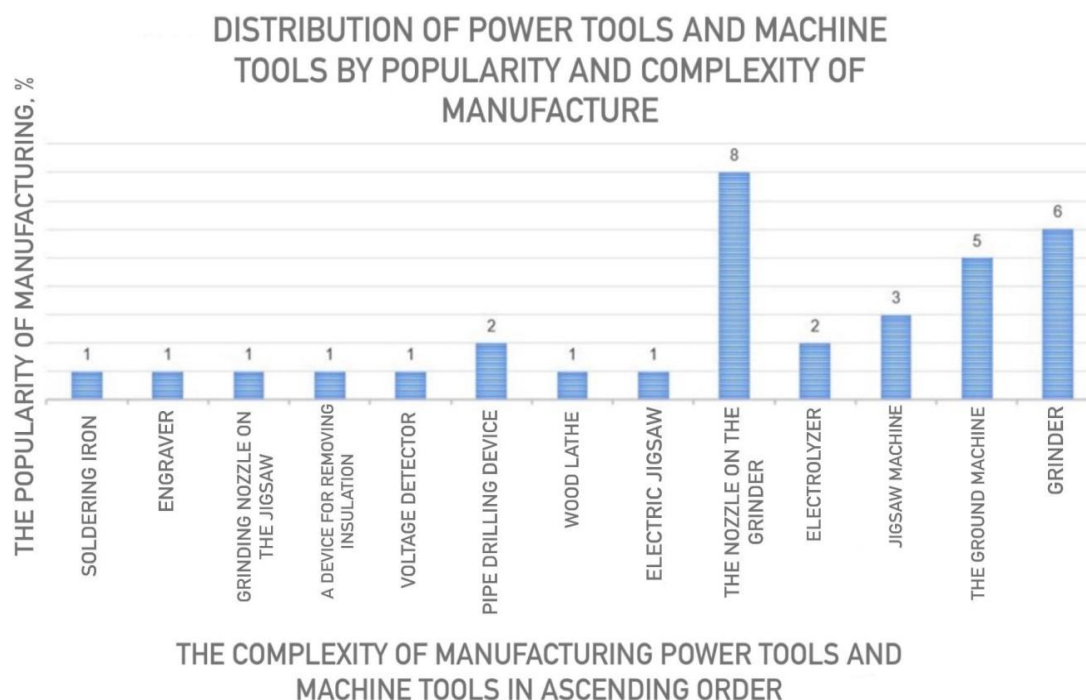
**Figure 2.** Distribution of hand tools by popularity and degree of difficulty

The most manufactured tool, the drive of which is an electric motor or power tool, is a nozzle for an angle grinder – 8% in its various forms: a renovator nozzle, a reciprocating saw nozzle, a grinding nozzle. The grinder is one of the most popular tools in the workshop, so many are trying to get the most out of its potential by creating various attachments and accessories, as this can significantly save on tools. The second most popular product was the grinder, about 6%. This is a fairly expensive machine required for metalworking. The third most popular tool for making a tool is a grinding machine, videos on its manufacture take 5% of the total number of videos. Further, as for hand tools, the distribution of tools is presented in order of increasing complexity of manufacture (fig. 3), and for clarity, this distribution is presented: Sandblasting – 2%;





Soldering iron – 1%; Engraver – 1%; Grinding attachment for jigsaw – 1%; Device for stripping insulation – 1%; Voltage detector – 1%; Device for drilling pipes – 2%; Wood lathe – 1%; Electric jigsaw – 1%; Grinder attachment – 8%; Electrolyzer – 2%; Jigsaw – 3%; Grinding machine – 5%.



**Figure 3.** Distribution of power tools by popularity and degree of complexity

Based on the videos we analyzed, the content authors do not primarily seek to help the user but give their videos uninformative clickbait names, for example “DON'T WASTE YOUR MONEY!!! DO IT YOURSELF!!! COOL TOOL with your own hands!!!” Videos with similar names in our selection turned out to be 27%. However, there are titles containing the topic of the video, but not reflecting the essence. They mention materials, tools and manufacturing methods, but do not mention the product itself: “THE SECRET of an ordinary anchor makes for a cool tool.” Such names turned out to be 30%. There were also videos in which the name of the manufactured tool or machine is indicated most informatively, for example “GRINDER MADE OF RAIL.” There were 43% of such videos.

In their tool-making instructions, authors can interact with the viewer in different ways. In some videos, they talk in detail about the manufacturing process and the scientific principles of the processes taking place. In the video about creating a reyer from a chisel, the author tries to interest the viewer in blacksmithing, talks about the basics of this business, about the physical and chemical components of the processes taking place. Such videos in our selection are 9%. In other videos, DIY-makers provide



useful tips to the viewer, talking about alternative methods and important subtleties of manufacturing. Videos with a similar DIY approach to content creation are 45%. It is also possible to highlight videos in which authors do not understand the technological process and do something according to the guide of other self-made artists, as a result of which they are not ready for non-standard situations and cannot explain to the viewer what and for what purpose they did something – an example of such an approach can be a video in which a blogger makes a radius cutter from an automobile valve. He clearly repeats the content of someone's video, since he has no idea what the tool he makes is for, and tries to come up with the uses of his product on the go. However, most DIY people understand what they are doing, there are 78% of them. In some videos there are “harmful tips” – the author, who does not understand the technology or the process, tries to explain in his own words, but due to lack of competence misleads his audience. There are quite a lot of such videos, as many as 24%. The best example is a video in which the author creates a jack made of PVC pipe. This design would not be able to lift the weight of the car. The authors of such videos resort to deception and insert a second factory jack, which is not visible. More than once, other DIY makers have refuted this invention, proving that this design does not work.

Because of the tools and machines in our sample are very different, the technological operations used in their manufacture also have different degrees of complexity and require caution in handling machines, cutting tools, heating and electrical equipment. In some of them DIY-makers violate safety regulations at work in order to perform a complex operation without the necessary equipment. Videos in which safety regulations are violated in any way (lack of personal protective equipment, eating at the workplace, misapplying tools by using them for the wrong purpose) account for 38% of the entire list. In one of them, the author created a milling cutter for angle grinders by screwing the screws into an old petal disk. Such a construction can fly apart when used and injure both the author of the video and its operator. At the same time, in 21% of cases, violations of technology for workplace safety are not dangerous to the health of the DIY maker. Most often, when trying to repeat such an operation, viewer will not harm themselves, but may break or damage the instrument. For example, in one of the videos, the author uses a screwdriver instead of a lathe. This reduces its service life by creating an unusual load for the tool. There are masters who do not violate technology for workplace safety and do everything very carefully, there are about 57% of them. Some of them (12%) explain possible errors and urge the viewer to comply with TB.

One of the most important parameters of self-made crafts is their replicability. A criterion that reflects how easy it is to repeat the author's actions and make such a tool yourself. First of all, a person who wants to repeat something should evaluate their abilities. Videos with homemade tools vary greatly in the necessary skills. So, for example, in a video about making a reismus from a ruler and wooden bars, the author needed skills with a hand tool (he used a chisel, a hacksaw and a screwdriver, which can





be replaced with a manual screwdriver). There were about 23% of videos with a similar level of complexity. It is worth highlighting the most popular category, videos in which a power tool is used. These are about 79% of the total. Also, in the video about the creation of a homemade grinder, a whole machine park is used, requiring professional work skills. Products of similar complexity are presented in 41% of videos. Thus, everyone can choose for themselves an suitable method of making a particular tool.

It is worth considering the material used by the authors of the video. A self-made product is easy to replicate if materials that can be purchased at any hardware store are used in its creation, such as plywood, wood, metal profile, sheet metal, various hardware. Similar materials were found in 69% of the videos, but this does not mean that anyone can buy all the materials in the first construction store they come across, since usually, in addition to easily accessible materials, in 71% of cases DIY makers use materials that are purchased in specialized stores, such as metal round bar, non-ferrous metal blanks, plexiglass. But that's not all. Often the author uses materials that are difficult to acquire, for example, an engine from a broken angle grinder, a gear of a certain size with the right number of teeth, an old sewing machine or a thick sheet of alloy used in some narrow industry. Such materials are quite difficult to acquire. Videos with their use make up about 18%.

It is most convenient to replicate self-made things, knowing the necessary dimensions. About 4% of DIY workers attach drawings and additional materials. The videos in which the author shows such attention to the possibility of replicating the self-made work came from two channels. Danya Craster, the host of the Galileo TV show and the founder of the SuperCrastan YouTube channel, provides drawings or 3D models of his products in file format for Fusion 360 for free, while Alexey Burkan from the ALEX LAB channel provides drawings of his inventions when one agrees to a sponsored subscription to the channel. In the video itself only some dimensions are indicated. About 40% of authors voice or demonstrate basic dimensions in their videos. Often the author does not specify a certain size, since it is associated with some other already specified size, or depends on some variable parameter. For example, in the video about creating a jigsaw, we understand that the height of the frame must correspond to the length of the saw used, so this size is not specified. In such cases, we can say that the size is indicated implicitly. This approach occurs in about 39% of videos. 41% of DIY makers completely neglect the size, making it difficult to replicate the product. In 52% of cases, the dimensions are not specified, since only the principle of the self-made work is important, and not its size or shape, as, for example, in the video about creating an awl or soldering iron.

Before you do something according to the guide from YouTube, you need to assess how appropriate it is to replicate the tool in question, how well it works compared to the original. When analyzing the data, it turned out that 8% of the self-made tools do not work. This is a small percentage, but, having stumbled upon such a video, an inexperienced viewer can waste time and resources. It is quite difficult to



achieve factory-made quality in garage conditions, it requires a large number of tools and skills to work with it. Therefore, in about half of the cases, about 51%, the tool works worse than its factory counterpart, but it performs sufficiently well the tasks for which it is intended. There are DIY crafters who are able to ensure that their products work on a par with their factory counterparts. Such videos make up 42% of the sample.

Also, the feasibility of manufacturing a product is affected by how long it will last. Often, the tool that the DIY makers create cannot be used more than once, as it quickly fails. About 19% of the instruments are disposable. For example, a core made of a bolt will fail after the first use, since the steel from which the bolts are made does not have the necessary hardness. Most tools justify their manufacture, for example, in the video about the creation of the press, the machine resource pays for the time and materials spent. There were 65% of such videos. In 58% of the videos, the manufactured tool will last a long time, even if it is used daily, for example, a grinding machine with an inclined mechanism.

An important component of any tool is its appearance. Not only engineers, but also designers work on any tool sold in the store to make it ergonomic and aesthetic. It is much more pleasant to work with such a tool, and in any case, careful manufacturing can be considered a guarantee that this tool works and will actually be used by a DIY specialist in subsequent projects. However, 19% of the tools from our selection were made carelessly. They did not receive any additional processing which is why they have a bad appearance such as untreated welds, an inhomogeneous surface structure of the product, or fastening of parts with duct tape or hot glue. The 69% of correctly and beautifully made tools and machines received additional finishing treatment, for example, by being processed with sandpaper, a grinding machine or sandblasting, after which they are painted. The final processing of the products was carried out in 64% of the viewed videos.

## INSTRUCTIONS FOR TOOL CREATION

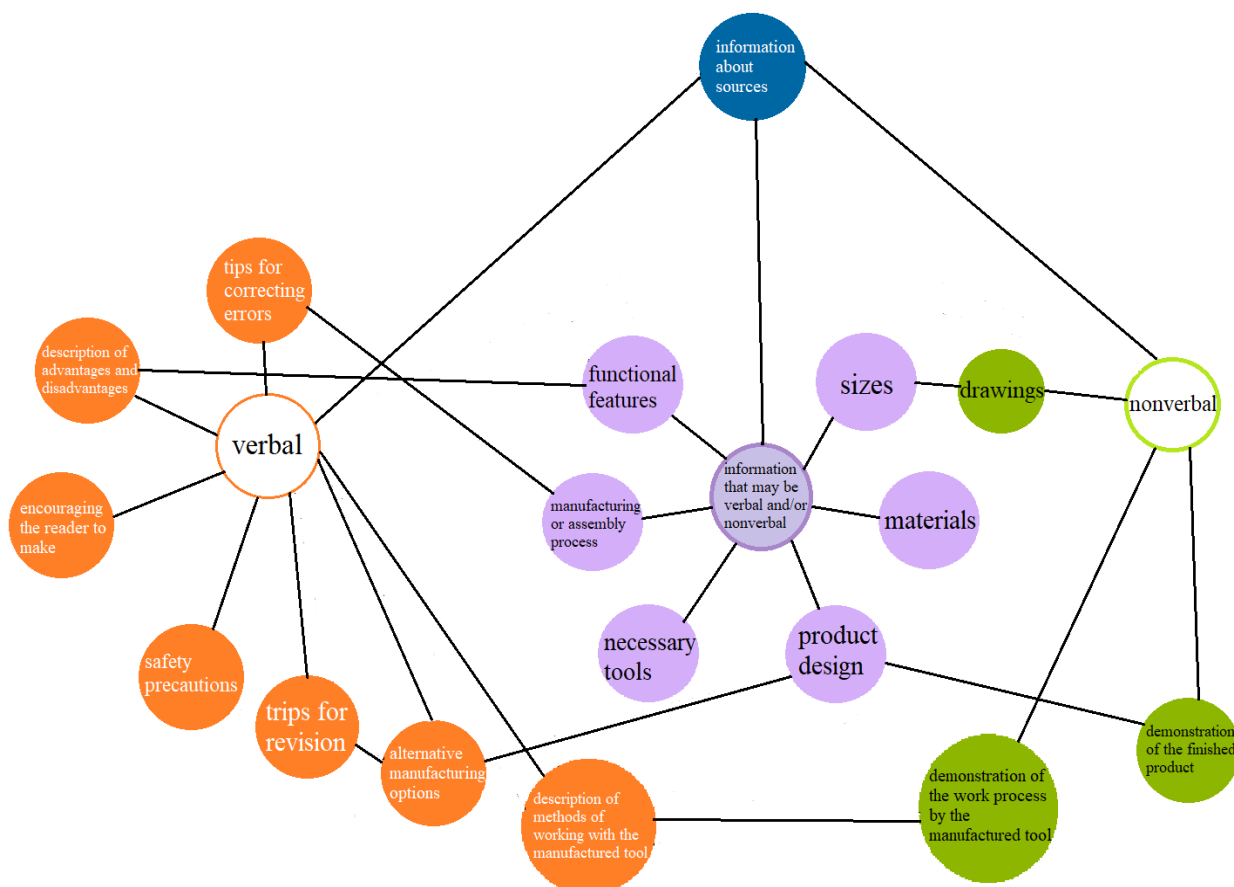
Do not think that DIY became widespread only with the advent of the internet. Today, the YouTube video hosting site is the easiest way to get information, it allows you to unite individual DIYers in a community and make their work publicly available. This creates the illusion that this is a new and evolving direction.

In fact, craftspeople have always made self-made products, but the way of exchanging information between each other and the lay people was different. Before the advent of the internet, DIYers, builders and makers used books, magazines, and oral speech to transmit and receive information. For example, *Do It Yourself* magazine describes a method for creating a lathe from a hand drill. Also, this method has been repeatedly presented in videos by DIY makers on YouTube. It is worth analyzing two different sources that represent the same product in order to discover why people choose YouTube instructions over those in a magazine. In order to make our analysis more



visual, we decided to break the information in the sources into structural groups that are presented in the diagram.

This diagram shows the criteria by which we analyzed videos as well as articles from the magazine. We decided to look for the difference in the presentation of information and the way it is presented. The diagram shows that information can be verbal (orange), non-verbal (green), information that is presented in the analyzed sources in combined form (purple) (fig. 4).

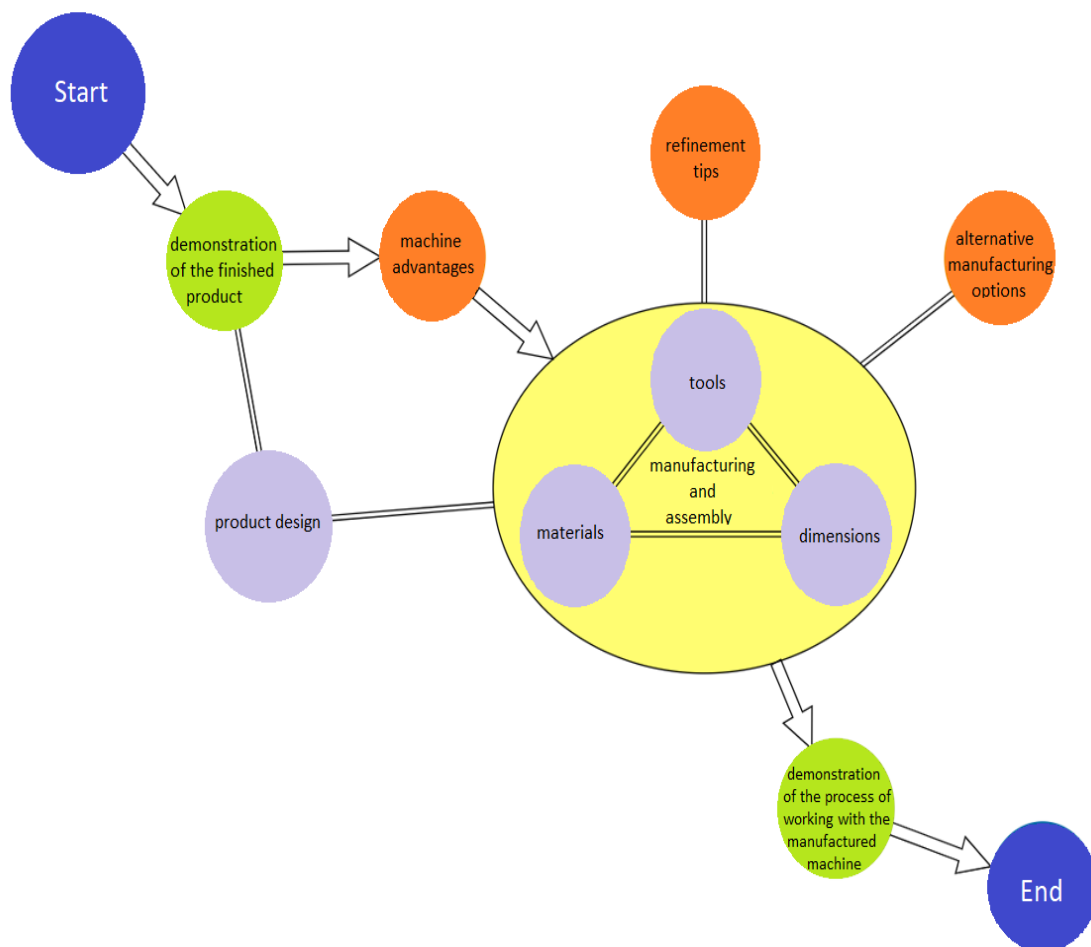


**Figure 4.** Diagram of criteria for video and article analysis

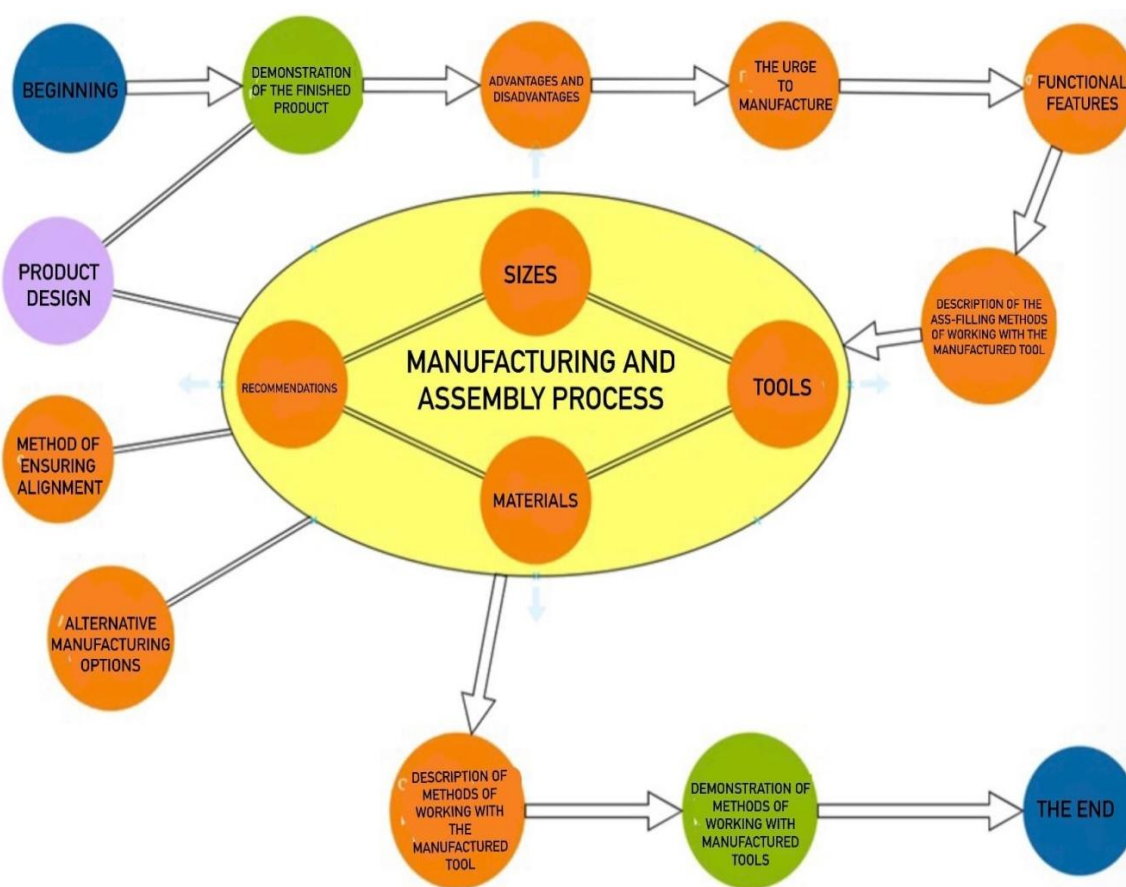
First of all, a clear difference between a magazine and a video is the form of information submission. The magazine contains a large amount of text and several pictures, while YouTubers try to focus on visual information, often filming videos without voice guidance (only music and the production process). We watched about 10 videos about creating a lathe from a drill and chose the most informative one with a description of the assembly process and the method of manufacturing parts. Below are the schemes for the video and for the magazine, respectively. The arrows show the chronology of information presentation. Double lines for a structure indicate that it is



presented during the demonstration of the finished product, as well as during the assembly process, for advice on rework and alternative manufacturing options – that they are related to the manufacturing process, but do not have a specific place in the text. that is, they are represented by fragments. The yellow oval contains loop elements that appear several times both in the video and in the article (fig. 5).



**Figure 5.** Scheme of presenting information in the video (creating a lathe from a hand drill)

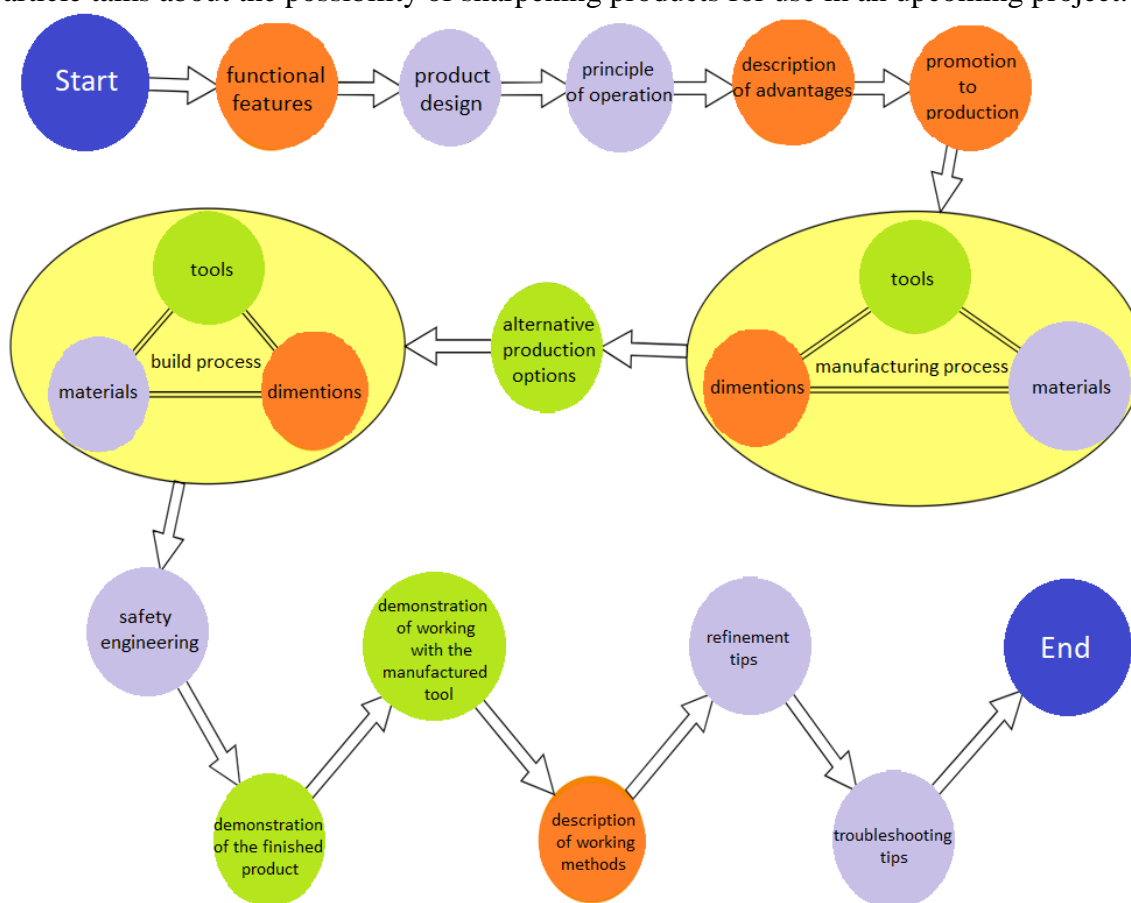


**Figure 6.** Scheme of presenting information in the article  
 (creating a lathe from a hand drill)

In both types of source, the story begins with a verbal description of the advantages, disadvantages, and functions of this machine, but there are differences. The article focuses on ease of use, and in the video on the versatility of the product. The article also adds the reader's urge to make self-made products: the authors say that the machine being manufactured has already been tested and justifies its manufacture: “Working with the proposed manual lathe has proven itself in practice. It gives an excellent result when turning small parts, is easy to use and, most importantly, it allows you not to get nervous that the noise from it causes trouble for neighbors.” (Sarafannikov, 2008, p. 15). It is worth noting that both kinds of source present information as accessibly as possible for the purpose of repetition. In the video, the DIYer pays special attention to this, before scoring the dimensions, the dimensions are also demonstrated visually using the tape measure attached to the parts. The text of the magazine gives exactly the size recommendations and explains why this one was chosen. As for the materials, in both cases the information is transmitted verbally. In the watched video clip, a description of the manufacture of parts is given, but the process of their manufacture is not demonstrated either. The magazine describes in detail the manufacturing process of each part, the pictures show some finished parts, the operations for marking the parts are presented. The authors of both options indicate alternative options for the manufacture of some parts or structural assemblies. This



helps the reader or viewer to repeat the process of making the self-made product, but such options are not shown either in the video sequence or in the picture in the magazine. In addition to alternative options, the authors tell you how to eliminate some of the mistakes that you might have made at your first attempt. This proves once again that these guides are aimed to enable repetition. The finished product is presented in both cases, it is demonstrated at the beginning and at the end of the video, as well as in the figure at the beginning of the article before describing the design of the machine, which is not required in the video, since everything is already visible. At the same time, nowhere are the safety precautions for the manufacture of the machine described, on the assumption that the product itself is not dangerous if handled correctly. The very work with the machine is described in detail in the article with a proposal for several ways of working, one of which, the most convenient, is described in detail. In the video, the process of work is not described in words, the author simply sharpens the workpiece to the music for several minutes, demonstrating the capabilities and performance of the machine. At the end of the video, the author demonstrates the resulting detail, and the article talks about the possibility of sharpening products for use in an upcoming project.



**Figure 7.** Diagram of the flow of information in video (manufacture of an electrolyzer)





An electrolyzer is a special device that is designed to separate the components of a compound or solution using an electric current. The author of the video is Alexey Burkan from the YouTube channel of the same name in his videos about the manufacture of an electrolyzer. Along with E.V. Kubasov in his article “Plasma torch” in the magazine “Do it yourself” 2/2007, he suggests using the electrolyzer as a generator of oxygen-hydrogen fuel for the burner. In figures 7 and 8 there are diagrams showing the sequence of supplying information for both sources.

As one can see from the diagrams, the information in the sources is presented more structurally than in the previous example. The authors have broken the presentation of information into separate parts in order to simplify the experience of the reader. The video is divided into three parts, in the first part, the builder tells how to make the electrolyzer itself, the second video concerns the manufacture of a hydrogen burner and the rest of the systems of this tool, the third video is devoted to advice on manufacturing and correcting errors. The article in the journal is no less voluminous and is subdivided into paragraphs, such as: a few preliminary words, the principle of operation of the device, the purpose of the device, the composition of the device, the electrolyzer, the dryer and the water seal, the burner, the power supply, the layout of the structure, some of the results of experiments with the burner, about safety measures during the operation of the burner, a few final words.



**Figure 8.** Diagram of the flow of information in text (manufacture of an electrolyzer)



As one can see from the diagrams (fig. 8, 9), the information in the sources is presented more structurally than in the previous example. The authors have broken the presentation of information into separate parts in order to simplify the perception of the reader. The video is divided into three parts, in the first part, the home-builder tells how to make the electrolyzer itself, the second video concerns the manufacture of a hydrogen burner and the rest of the systems of this tool, the third video is devoted to advice on manufacturing and correcting errors. The article in the journal is no less voluminous and is subdivided into paragraphs, such as: a few preliminary words, the principle of operation of the device, the purpose of the device, the composition of the device, the electrolyzer, the dryer and the water seal, the burner, the power supply, the layout of the structure, some of the results of experiments with the burner, about safety measures during the operation of the burner, a few final words.

At the very beginning of the video, the author, using illustrations, talks about the functional features of his self-made product, shows and tells how the device (product design) works, verbally and visually explains the principle of operation, and also lists the advantages of his invention. Thus, he wants to induce the viewer to make such an instrument, which he repeatedly talks about in the video. The author of the article acted in a similar way, describing at the beginning the principle of operation, functional features, advantages and disadvantages. We observe the design of the product together with the finished product in the article on the drawing and photographs of the already assembled device.

The process of making an electrolyzer in the video can be represented by the first cycle, located in Figure 7. It includes blocks: the sizes voiced by Alexey, demonstrations of the work with tools in the manufacture of each part, this is how we understand what we need to repeat, as well as enumeration and visual demonstration of materials. In the article, the main information load falls on the drawings, from which we learn about the necessary materials, and also see the dimensions. Information from the drawing is partially duplicated in the text of the article. The structural block responsible for the manufacturing process, including drawings, we see in the yellow oval in Figure 8.

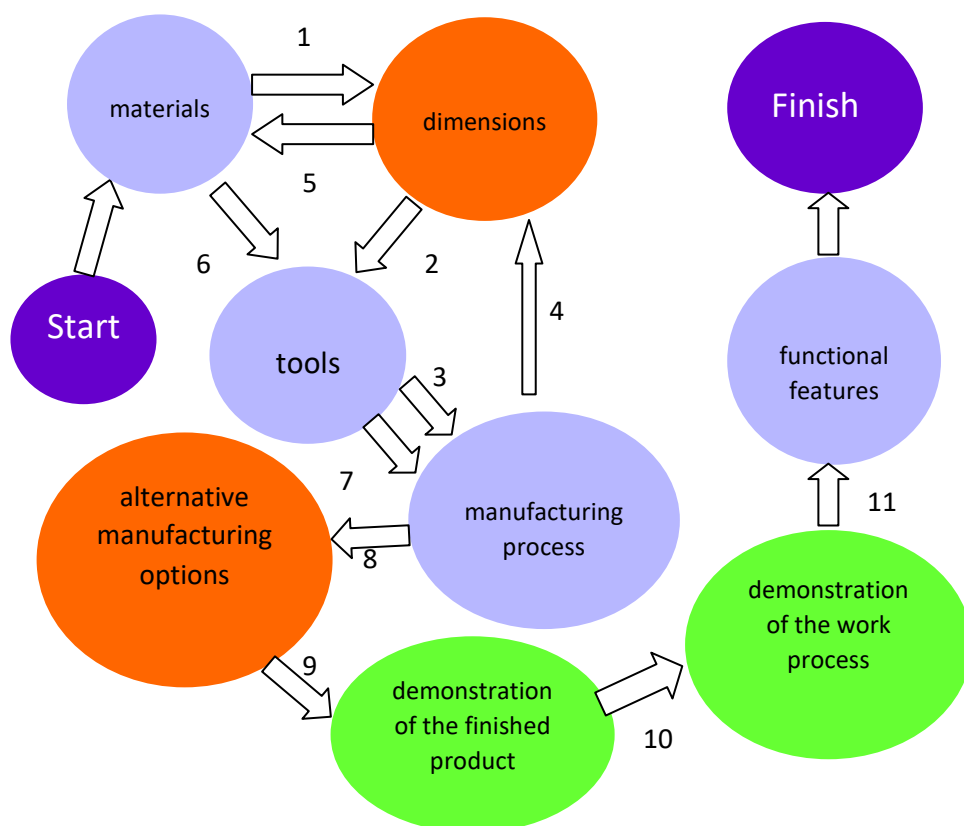
The second part of the video begins with alternative options, after which the block of the manufacturing process is repeated, but for the burner parts. During the manufacturing process, the author warns of a possible danger, showing a video sequence, with an explosion of a fuel cylinder, as a result of the absence of a flame arrester valve. He tells how to avoid this by using additional structural elements (water seal and fire arrester valve). The author of the article talks about the same dangers, but at the end of the article. Following further on the diagram for the article from the magazine in Figure 8, you can see the description of the tool, which is the power supply unit of the manufactured device. The author offers several options for manufacturing the device. Further, he gives advice on improving the product and correcting mistakes, and a description of the process of working with the manufactured burner is also important.



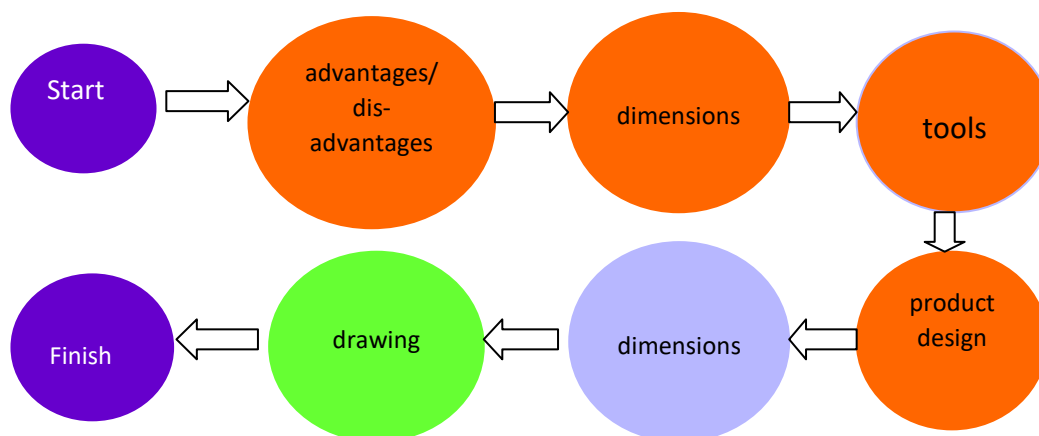
Let's move on to the video again, after finishing the assembly of the device, the DIYer demonstrates the finished product and methods of working with it. The following is a description of the methods of working with the tool. The third video from this series on the manufacture of an electrolyzer is devoted to correcting mistakes made in the design of this device so that the viewer does not allow them, and the home-builder also gives advice on revision.

Thus, we see that the considered video and magazine text practically do not differ in content. However, the difference in the presentation of information is significant. While in the video the DIYer talks about the essence of the ongoing processes, tries to explain complex things so that the viewers, understanding the principle, can think out, improve or adapt the design for themselves, the author of the article from the magazine focuses on drawings, product standardization and accurate numbers, even regarding the concentration of the chemical solution required for electrolysis.

Another example would be a pairing where the video is the more informative source. Two needle file collets were considered. Below are block diagrams (fig. 9, 10) by which you can see the difference in the presentation of information. As you can see, there is much more phase in the video. The circuits turned out to be simpler and the sequence is shorter.



**Figure 9.** Block diagram of information presentation in video (needle file collets)



**Figure 10.** Block diagram of the presentation of information in the article (needle file collets)

First of all, the dimensions in these sources are presented twice. In the video, all sizes are presented verbally. First, the dimensions for one part are presented, then the dimensions for the manufacture of another. And in the article, the dimensions are first presented verbally, and then non-verbally in the drawing. As for the tools, in the video, the tools are not only announced by the DIYer, but also shown in the video series. In the article, the specified tool is part of a self-made product, while the tool necessary for manufacturing is not indicated, and the manufacturing process is also not indicated, which is described in detail in the video. At the same time, the video does not describe the design, the author only makes parts and assembles them together. The video demonstrates the finished product, as well as the process of working with it, which is also in the article. Importantly, the DIYer talks about alternative manufacturing options that require more sophisticated equipment. In the video, in contrast to the article, materials are indicated, moreover, for various structural units. The video demonstrates the functional features, the author tells how you can use this self-made product, and in the article the author talks about the advantages of his product, talking about the convenience of working with it.

Comparing the presentation of information from these sources, we can conclude that the journals provide a very detailed textual description, where the readers themselves have to analyze and present all the actions performed. In the video, due to the large amount of visual information, the viewers learn how to make things work but do not grasp it intellectually for lack of explanations. This prevents the viewers from realizing the essence of the actions, it will be more difficult for them to adapt to other conditions. Viewing the video is much easier, the viewer has the opportunity to repeat all the actions of the author step by step. However, in order to make changes to the design, to come up with one's own self-made products and refine them, one needs to study and analyze several sources of information.

Among the articles and videos, there are options varying in quantity and quality of information. We believe that magazines can be very useful for DIYers even now,



perhaps they are undeservedly forgotten. However, it is difficult to deny the fact that videos on developing YouTube channels can already surpass even the most detailed articles in their usefulness. It has always been easier for people to visualize complex processes so as not to imagine them in their heads, modern videos with DIY themes, selected competently, are able to give a person who wants to do something with their own hands, not only a guide, a drawing or the procedure for carrying out technological operations, but also understanding of the ongoing processes, as well as the ability to improve the device based on the author's mistakes.

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