EUROPEAN
COUNCIL FOR
STEINER WALDORF
EDUCATION

# Media Education in Steiner / Waldorf Schools

A good practice example: Curriculum and Equipment

Bund der Freien Waldorfschulen

Freie Hochschule Stuttgart
SEMINAR FÜR WALDORFPÄDAGOGIK

# Foreword

In the European Council for Steiner Waldorf Education, we closely follow EU policy making in the field of education. One of our key priorities in this regard has been a meaningful contribution to the topic of digital media education. To help our schools adapt to policy reform and be prepared for the national level implementation of the EU's Digital Education Action Plan 2021–2027, we present this brochure.

As the pressure for using digital technology in education has further increased during the COVID-19 pandemic, it is vital to present credible examples of ICT and media education in Steiner Waldorf schools.

Steiner Waldorf schools appreciate the profound role of digital technology in the digital age and in this regard the importance of adequate education. Consequently, they have developed a comprehensive and holistic approach to ICT and media education that is rooted in the thorough understanding of child development and carefully weighs the benefits and risks of using digital tools in a given context at a given time. This brochure provides schools with a framework for developing their own age-appropriate and development-oriented ICT and media curriculum that aims towards students developing media maturity and equipping students with all the necessary skills to fully seize the potential of digital technology for their own benefit.

In the light of growing pressure to digitalise education from an early age, we believe this brochure can shed more light on the Waldorf approach that aims for a healthy child development and promotes that the real world experience must come prior to the start of digital media usage. Thus it offers an elaborate response to the educational challenges of the digital transformation and helps our member associations and schools to be prepared for the next wave of curricula reforms across Europe.

We would like to express our gratitude for the joint work of the Freie Hochschule Stuttgart and the Bund der Freien Waldorfschulen in Germany. Even though the material was developed under German context, we believe that the proposed practices are transferable and can be tailored to other educational systems as well. They are not only meant to serve schools, teachers and parents but they can also support our member associations in communicating their specific needs and approach to ICT and media education to national and regional level authorities.

Richard Landl († 22 May 2021),
Former president of European Council
for Steiner Waldorf Education

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# Introduction

## MEDIA PEDAGOGY VERSUS MEDIA DIDACTICS

Due to the actions taken because of Covid-19, schools throughout the world had to switch to online lessons and teachers, students and parents experienced totally new learning situations. Although *digital media* was used to continue schooling, this should not be confused with *media pedagogy*.

Media pedagogy aims to enable children and young people to develop the skills they need to use the various IT technologies in everyday life in a meaningful way. This also means that they have learned where the limits of digital devices lie and where analogue methods have advantages. Media pedagogy aims to ensure that children and young people understand both digital and analogue technologies and have experienced their respective advantages and disadvantages in practical use.

Teaching with media (media didactics) has a different perspective: it focuses on how to communicate the content of various school subjects, such as German, history, English, French, mathematics, physics, etc., as effectively as possible through the use of media. These two areas should not be confused. Not only is it necessary that media pedagogical aspects be included in the existing curriculum, it is also important to take a critical look at the public pressure propagating the expansion of media didactics as necessary for modern teaching. A careful look shows that there are also commercial interests behind this pressure.

In the February 2021 issue of the magazine for media education, "Merz" the media educator Horst Niesyto published an article with the title, "Digital Education Becomes a Point of Entry for the IT economy". In his article, Niesyto calls on media educators to clearly criticize the comprehensive exploitation of personal data profiles by digital capitalism. The comprehensive study by the American economist Shoshana Zuboff, "The Age of Surveillance Capitalism" extensively traces how corporations are driving the accumulation of gigantic masses of data and the dangers this poses to a free society (Zuboff 2019). The sociologist Richard Münch describes this global development in the field of education in great detail in his book, "The Education-Industrial Complex". At the end, he warns that a complete cultural decline is imminent if schools are dominated by criteria external to education and by the profit interests of industries. (Münch 2018, p. 329). An English version of this book has been available since 2020.

An awareness of such global interests and pressures is also part of the media competence that schools, colleges and universities need to develop for themselves. Schools must be able to defend themselves and their pupils against interests alien to pedagogy and, at the same time, they have the important task of preparing children and young people for their lives in a technologized world. Schools therefore have a dual task.

## THE SCHOOL AS THE MEDIATOR

The justifications that are used to bring more digital technologies into the schools are often referred to as the necessity of a preparation for future life. People are quite right in this respect to point to current and foreseeable future technological developments. For example, the German Federal Ministry of Education and Research (BMBF) writes:

> *"Digital systems and tools permeate society. The world of work is changing as digitization progresses. [...] Digital competence is therefore of crucial importance: for each and every individual to be able to use digital media in a self-determined and responsible manner and to have good opportunities on the labor market; and for society to maintain democracy and prosperity in the 21st century."(BMBF 2019, translated by the author).*

This is an important consideration. However, if it is looked at alone, it is one-sided and obscures a fundamental issue. It is imperative to place it alongside another aspect that is central to all pedagogy. The educator Klaus Zierer formulates it clearly:

> *"Education and teaching always have the responsibility to serve the education of man. Consequently, the human being is the starting point and the goal. This principle must also apply to digitization in education. The digital cannot replace the teaching pedagogy. Instead, the digital must be subordinated to the teaching pedagogy." (Zierer 2017, p. 10, translated by the author)*

These two quotes reveal the fundamental polarity within which all education takes place. On the one hand, in order for human society to exist and also to develop, it is necessary that the future generation acquire a basic foundation of the necessary knowledge and skills. On the other hand, children have their own individual developmental tasks, needs and interests that must be considered and addressed. They bring their own impulses and hopes for their futures and these deserve to be respected and supported.
Teachers have to communicate this polarity: They have to be advocates for children and resist those demands which are pedagogically unjustified and they also have to present the legitimate demands of society to children. They need to defend children's living spaces against those interests that are far removed from education and they also have the task of bringing contemporary life to them – and this necessarily includes a well-founded media education.

Prof. Dr. habil. Edwin Hübner
von Tessin Chair for media pedagogy

Bundesministerium für Bildung und Forschung (BMBF) (2019): Wissenswertes zum DigitalPakt Schule. Available at: https://www.bmbf.de/de/wissenswertes-zum-digitalpakt-schule-6496.php Date: 10.04.2021.

Münch, Richard (2020): Governing the School under Three Decades of Neoliberal Reform, From Educracy to the Education-Industrial Complex. Available at: https://www.routledge.com/Governing-the-School-under-Three-Decades-of-Neoliberal-Reform-From-Educracy/Munch/p/book/9780367365356#

Niesyto, Horst (2021): "Digitale Bildung" wird zu einer Einflugschneise für die IT-Wirtschaft. In:merz, medien und erziehung, zeitschrift für medienpädagogik, Jg.65, Nr.1, Febr. 2021, S. 23-29.

Zierer, K. (2017): Lernen 4.0. Pädagogik vor Technik. Möglichkeiten und Grenzen einer Digitalisierung im Bildungsbereich. Baltmannsweiler: Schneider Verlag Hohengehren.

Zuboff, Shoshana (2019): The Age of Surveillance Capitalism, Profile Books.

# Media education at Steiner/Waldorf Schools Curriculum

## 1. Educational goal is media literacy

The goal of Waldorf education is to prepare children to meet the demands of life by the end of their schooling. A contemporary educator is naturally aware that children today are growing up in an age profoundly shaped by technology and media. Therefore, much of education in the present is media education. When young people leave school, they should be able to use all media appropriately; they should understand how different forms of media are technically constructed, and the nature of their aesthetic and social impacts.

With these overriding goals, Waldorf education attempts to meet the demands of the times. The decisive difference to other pedagogical views lies in the methodology of how the educational goal of "media literacy" can be achieved.

## 2. Development-oriented education

Media education in Steiner/Waldorf schools is based on the development of the child, and not on the presence of equipment. It pays attention to the fact that there are periods in a child's life when the intensive use of digital media of any kind hinders healthy development. During these periods, it does not rely on digital devices in education and teaching.

The first developmental task of the child is the training and mastery of its own body. In early childhood, the most important task of education is to stimulate the child to develop their motor skills, language skills, and creative imagination. This particularly includes the development of the senses and the healthy formation of the brain. A development-oriented education excludes as far as possible anything that hinders healthy physical development. Waldorf education therefore considers the use of ICT technology in the first years of life to be pedagogically destructive.

Waldorf education does not want to pursue a "conservative education" but an "enabling education"; the child should be encouraged to engage in a wide variety of activities through a stimulating environment. Children want to genuinely recognise the world by being active in it.

Waldorf education therefore starts out primarily from practical and artistic activities in order to introduce children to learning contents.

## 3. Aspects of media education from a Waldorf perspective

Learning to read and write in class 1 is the beginning of media education. The child learns to master the medium of writing, which still forms the basis of all media competence today.

The two other forms of media – image and sound – have also shaped human culture since time immemorial. Therefore, it makes sense for children to learn to draw and paint pictures themselves at an early age, as well as to play a musical instrument. These abilites provide the basis for their later judgements of media.

Analogue processes help children understand things in the true sense of the word. After children have become acquainted with analogue techniques, the basis is created for them to be able to judge when and how digital techniques can be used sensibly based on their own experience.

*In the first few years of life (up to around the age of six or seven), children should above all experience the **real world** in action, learn to understand and master **analogue** technologies in the transition to school, and, building on this (from the age of twelve), to finally be able to understand and work with digital technologies.*

## 4. Direct and indirect media education

Media education at Steiner/Waldorf schools includes direct and indirect methodology.

The task of indirect media education is to encourage children and young people to build and practice the skills they need in the information age, but cannot acquire in direct contact with media.

Indirect media education provides areas of practice where students can develop and exercise their powers of concentrated attention. Above all, it ensures that young people learn how to acquire knowledge, and how to create a meaningful whole from the many individual pieces of information provided by media.

*Indirect media education trains the self-competence required in the age of digital technologies.*

In the age of digital cyberbullying, it is necessary to provide children with fields of experience in which they can learn to treat other people with respect and understanding.

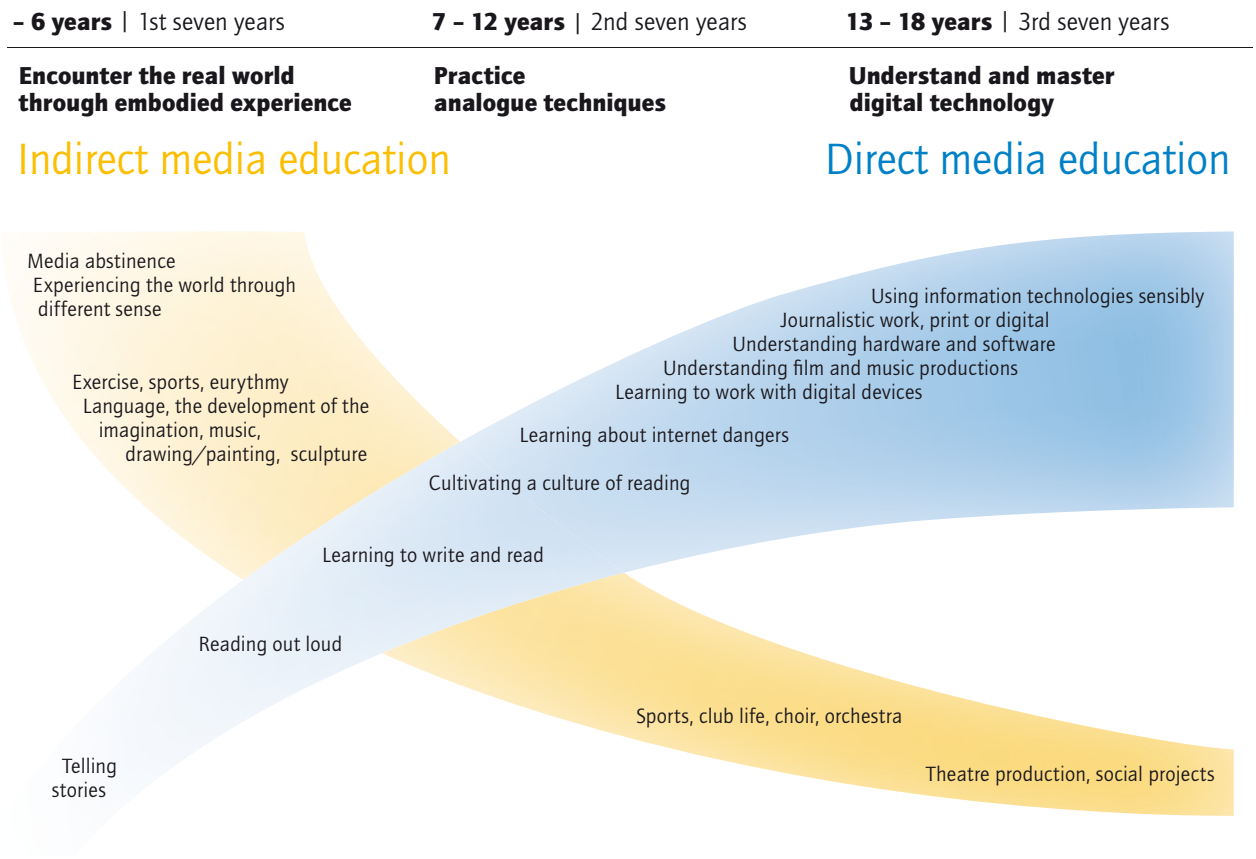
*Indirect media education trains social skills in a way that is necessary for the age of communication networks.*

Topics of direct media education are, for instance: How do I research skilfully on the Internet? How do I present myself in public? How do I behave in social networks? How do I sensibly deal with the possibilities of the Web 2.0? What mistakes and dangers should I avoid?

*Direct media education helps children understand how the different media work, how they affect people, and how they can be used sensibly.*

The fact that many children already use digital media at home at an early age does not mean that schools need to intensify this usage. On the contrary, precisely because of the many ways in which children use these devices, kindergartens and schools must be primarily concerned with creating balancing and healthy counterweights to the practice. In other words, doing with the children what is not always done at home.
The philosopher Gernot Böhme once succinctly formulated this idea by saying that education "must be anticyclical, i.e. it should promote precisely that which is not in the manifest trend of development."[1] Where Waldorf education is used as a method, there are no computers in the classroom before the age of 12, unless there are government regulations to the contrary. The meaningful, independent use of the computer requires the development of independent judgement, which most children have only gained by around the age of twelve. Only then does the use of computers become pedagogically meaningful and necessary.
This is why media education is divided into indirect media education that leads the adolescent person to individual maturity, and direct media education, which enables the self-competent person to deal with the media world in a meaningful way. Both factors together lead to media literacy.
The basic idea of a Waldorf educational media curriculum can be summarized graphically as follows.

1 Böhme, Gernot (1999): *Bildung als Widerstand*. In: Die Zeit, No. 38 of 16 Sep. 1999, p. 51 [Quotation translated from the German]




## 5. Phenomenological concept of media

Educators need a phenomenological approach to the concept of media; it is best gained by asking what forms of media people encounter in their everyday lives and how they deal with them. From this point of view, three levels can be distinguished for all media:

- Media content – that which is conveyed to people in terms of topics.
- Media form – the process by which the content is conveyed or presented, i.e.: written, still or moving images and sounds (music or speech).
- Media 'carrier' – the material basis on which the "formed" content appears.

Media education must take place on all these levels: as writing, image, sound, and on the level of media carriers, but also at the level of media content, where the ability to critique and reflect is important. A media concept can consider these separate levels as a guideline.

## 6. Levels of media literacy

If one takes this differentiated concept as a basis, then maturity involves not only the ability to use devices skilfully, but much more. It extends over six levels:

### I. *Media content*

1. Ability to understand and judge the content of texts, images and acoustic productions; this suggests the most comprehensive general education possible.

### II. *Media forms*

2. Ability to write and read.
3. Ability to produce and evaluate images, films
4. Ability to produce and judge music productions, radio reports.

### III. *Media carrier medium*

5. Know the basic functioning of important devices and the internet, including mechanisms and structures on a social level.
6. Ability to work with devices technically.
7. Ability to use devices for learning in a meaningful way: research and presentation.

### IV. *Self-competence*

8. Ability to concentrate, mindfulness.
9. Self-control, mental discipline.
10. Ability to actively commit to something; developing interest and initiative.

### V. *Social skills*

11. Empathy.
12. Responsibility.
13. Creative and artistic-aesthetic skills.

### VI. *Competence in action*

14. Ability to implement projects.
15. Knowledge of strategies.
16. Ability to use equipment and procedures.

A prehensively conceived media education has to take these different areas into account and stimulate the training of these skills. The development of media literacy is the backdrop to the media education concept of Waldorf schools. It concerns all classroom learning.
Here we shall examine levels I (media content), II (media forms) and III (media carriers), first listed in tabular form and then discussed in detail.
Then we reconsider these aspects in light of the abilities (competencies) to be developed, i.e. levels IV - VI, but from the salutogenic point of view. The process is repeated in the form of a tabular overview.
However, it must be remembered that tables force into an artificial corset something that in reality forms a living and breathing whole, rendering such tables abstract.
Concrete examples are given. The class levels suggested in the table represent the earliest point in time at which the corresponding teaching content can be useful. In practice, this must of course be related to the developmental situation of the respective pupils in a specific class.
Then topics for a short block in class 6 are suggested, which address basic behaviour on the internet and also address the possible dangers and problems involved with online behaviour. The aim is to ensure that the methodology of this class is practice-oriented. Just as in the class 3 agriculture block in which the children concretely cultivate, harvest and process grain, so the future adolescents should create their first media products and understand the mechanisms and rules of media.
Finally, we focus on the equipment to be purchased that is needed for a robust media education concept.

| Baselines of a media educational concept: | Media content ✓ | Media form: writing A |
|---|---|---|
| Pre-school | | Picture Book |
| Class 1<br>Age 6 – 7 | Design the pages of the copybooks in an attractive, orderly and balanced way.<br>Structure and design block or project copybooks in a meaningful way. | Learn to write and read. |
| From class 2 to 3<br>Age 7 – 9 | | Set up a class or school library.<br>Cultivate reading culture. |
| From class 4 to 5<br>Age 9 – 11 | Use books for research.<br>Use analogue media in a presentation.<br>Conduct regular small presentations on various topics. | Research in book collections and libraries. |
| Class 6<br>Age 11 – 12 | | e.g. School newspaper. |
| Class 7<br>Age 12 – 13 | | Learn to master the ten-finger typing system on the keyboard. |
| Class 8<br>Age 13 – 14 | Research the web with search engines, learn different types of search engines, basic procedures and aspects of searching, getting to know specialized portals and trustworthy research portals. Security in networks.<br>Correspondence on the internet. | Learn to structure letters of application, Curriculum Vitae, business mail. Netiquette. |
| Class 9<br>Age 14 – 15 | | Create internship report with word processing, get to know the most important functions. |
| Class 10<br>Age 15 – 16 | Assess credibility criteria of sources.<br>Journalistic work with digital or print media, image editing, audio editing.<br>Practically testing and reflecting on presentation techniques with PC, overhead, flipchart, blackboard, etc.<br>Use presentation software sensibly. Knowing different points of view on arranging data in a meaningful way.<br>Know the differences between the different file formats. | Typography typeface:<br>create own font. |
| Class 11<br>Age 16 – 17 | | |
| Class 12<br>Age 17 – 18 | | |

| Media form: sound & language | Media form: image | Media carrier |
|---|---|---|
| Singing and making music,<br>Reciting. | Painting with wax crayons<br>or watercolours. | |
| Singing, extending the range of songs.<br>Making music with simple instruments.<br>Learning to play an instrument.<br>Reciting poems, etc. | Painting with watercolours & coloured pencils. Form drawing.<br>Learning colour tones. | |
| | Drawing illustrations.<br>Increasing differentiation of the image design. | Manufacture paper. |
| Beginning of musicology, recognition of the natural laws of music. | Increasingly more exact drawing,<br>e.g. within scope of botany and zoology. | |
| Continuation of listening training and listening through first radio projects. | Beginning of the theory of projections and shadows.<br>Learning the laws of perspective through practical tasks.<br>Camera obscura. | "Media driver's license". |
| | | Practical bookbinding. |
| Class play. | | Working with microphone and camera. |
| Getting to know musical cultural development up to contemporary music.<br>Analysis of contemporary popular music and film music.<br>Production of radio features, interviews, radio plays. | Painting and drawing at higher skill levels.<br>Getting to know the language of photographic and cinematic pictures from practical experience.<br>Creating one's own film.<br>Analysing films and advertising. | Getting to know the dual system in mathematics. Learning to understand the basic functioning of the telephone. |
| | | Logical circuits, getting to know the basic structure of a CPU.<br>Historical and cultural aspects of IT technology. |
| | Digital image processing from an artistic point of view. | Coding. Programming of microcontrollers, such as Arduino. Radio technology up to mobile radio. |
| Theatre project. | | Data transmission in the network.<br>"Big data".<br>Basic ideas of neural networks and artificial intelligence. |

| Baselines of a media educational concept: | Media content |
|---|---|
| Pre-school | |
| Class 1<br>Age 6 – 7 | Design the pages of the copybooks in an attractive, orderly and balanced way.<br>Structure and design block or project copybooks in a meaningful way. |
| From class 2 to 3<br>Age 7 – 9 | |
| From class 4 to 5<br>Age 9 – 11 | Use books for research.<br>Use analogue media in a presentation.<br>Conduct regular small presentations on various topics. |
| Class 6<br>Age 11 – 12 | |
| Class 7<br>Age 12 – 13 | |
| Class 8<br>Age 13 – 14 | Research the web with search engines, learn different types of search engines, basic procedures and aspects of searching, getting to know specialized portals and trustworthy research portals. Security in networks. Correspondence on the internet. |
| Class 9<br>Age 14 – 15 | |
| Class 10<br>Age 15 – 16 | Assess credibility criteria of sources.<br>Journalistic work with digital or print media, image editing, audio editing.<br>Practically testing and reflecting on presentation techniques with PC, overhead, flipchart, blackboard, etc.<br>Use presentation software sensibly. Knowing different points of view on arranging data in a meaningful way.<br>Know the differences between the different file formats. |
| Class 11<br>Age 16 – 17 | |
| Class 12<br>Age 17 – 18 | |

# Design and use media content meaningfully

Sovereignty in dealing with the media requires mastery of several alternative ways to achieve a goal. These will continue to include analogue media such as pen and paper in the future. The graphic design of the pages of a copybook with coloured pencils, fountain pens, etc. is a particularly easy way of practicing basic graphic-art skills as a young child; such capabilities can then be used later in dealing with digital design tools.
The ability to present content in a sovereign way requires the ability to efficiently research knowledge of both digital and analogue nature. To this end, it makes sense for students to be familiar not only with standard books, but also with internet-based subject portals and research portals, as well as available libraries.
It is essential – and a good general education is necessary for this – that young people are able to critically assess the sources they have found. The necessity of learning to critically evaluate sources must therefore be taken up throughout the entire upper school years and in all lessons where it makes sense. It is also recommended that students be given the opportunity to practice journalistic work using practical examples. They can do this by working with digital media, such as a blog, but also with print media, such as a school newspaper.

| Base lines of a media educational concept: | Media form: writing A |
|---|---|
| Pre-school | Picture Book |
| Class 1<br>Age 6 – 7 | Learn to write and read. |
| From class 2 to 3<br>Age 7 – 9 | Set up a class or school library. Cultivate reading culture. |
| From class 4 to 5<br>Age 9 – 11 | Research in book collections and libraries. |
| Class 6<br>Age 11 – 12 | School newspaper. |
| Class 7<br>Age 12 – 13 | Learn to master the ten-finger typing system on the keyboard. |
| Class 8<br>Age 13 – 14 | Learn to structure letters of application, Curriculum Vitae, business mail. Netiquette. |
| Class 9<br>Age 14 – 15 | Create internship report with word processing, get to know the most important functions. |
| Class 10<br>Age 15 – 16 | Typography typeface:<br>create own font. |
| Class 11<br>Age 16 – 17 | |
| Class 12<br>Age 17 – 18 | |

# Media form: writing

In the summer of 2012, university teachers in Germany complained that although students were good with computers and the internet, they had serious shortcomings in their reading skills. *"They find it difficult to understand the central theme of a text [... and they are] not able [...] to follow the course of a lecture in their notes in such a way that they can use the information again later with profit".*[2]
This is alarming. In the opinion of many Waldorf teachers, it is due, in part, to the fact that children are allowed to handle highly complex technical equipment at an early age, before they have learned and practiced the basic skills necessary for competent use of computers and the internet. Well-developed reading skills are the indispensable prerequisite for all further educational success. *Reading is not only a part of media competence, it is the basic and key qualification that develops and promotes media competence in general.* For this reason, the curriculum of Steiner/Waldorf Schools initially places great emphasis on practicing the basic skills of writing and reading in a comprehensive and varied manner before digital information technologies are introduced in the classroom. This is also called for in the "Stavanger Declaration" of 2019, which was signed by over 130 reading researchers.[3]
In class 1, children learn how to write and read written material, first with artistic activity. From classes 2 and 3 onwards, they continually practice writing and reading skills. It is recommended to set up a library in each classroom so that the children can borrow the books that interest them. It is also very good if there is a school library available that offers suggestions and resources for independent reading. Reading groups especially set up for reading beginners contribute significantly to promoting a vigorous reading culture.

Starting in class 4 or 5, it is important that children get a first idea of what it means to "do research". Not everything can be found on the internet – indeed a great deal cannot. Huge treasures of knowledge lie hidden in libraries and are not accessible electronically. That is why it is still important for children to become familiar with libraries and to gain a sense of how to find something in the books kept there.

In class 7, students should develop the ability to write on the keyboard "blindly" with ten fingers, at least as long as computers are still being used with keyboards. In addition, in the following years they should gradually understand how to use the many possibilities of word processing programs and how to create artistically designed texts with their help.

2 TIMM, Ulrike; WOLF, Gerhard (2012): *Medienkompetenz sehr gut, deutsche Sprache mangelhaft, Studie fördert bestürzende Lücken* bei Studienanfängern zutage, in: http://www.dradio.de/dkultur/sendungen/thema/1818985/ (version 26 Feb. 2018 [Quotation translated from the German]

3 http://ereadcost.eu/stavanger-declaration

| **Baselines of a media educational concept:** | **Media form: sound & language** |
|---|---|
| Pre-school | Singing and making music,<br>Reciting. |
| Class 1<br>Age 6 – 7 | Singing, extending the range of songs.<br>Making music with simple instruments.<br>Learning to play an instrument.<br>Reciting poems, etc. |
| From class 2 or 3<br>Age 7 – 9 | |
| From class 4 or 5<br>Age 9 – 11 | Beginning of musicology, recognition of the natural laws of music. |
| Class 6<br>Age 11 – 12 | Continuation of listening training and listening through first radio projects. |
| Class 7<br>Age 12 – 13 | |
| Class 8<br>Age 13 – 14 | Class play. |
| Class 9<br>Age 14 – 15 | Getting to know musical cultural development up to contemporary music.<br>Analysis of contemporary popular music and film music.<br>Production of radio features, interviews, radio plays. |
| Class 10<br>Age 15 – 16 | |
| Class 11<br>Age 16 – 17 | |
| Class 12<br>Age 17 – 18 | Theatre project. |

# Media form: sound

Listening to music is one of the most important leisure activities for almost all young people. It is particularly important that children and young people learn to make reasoned judgments about the media-form "sound", based on their own (analogue-based) experience.
Already during pre-school, teachers sing together with the children, who acquire a more or less large repertoire of songs.
In the first years of school, singing and music-making continue to be intensively cultivated, and the range of songs available to the children is systematically expanded. Children in the early classes also learn to master simple musical instruments such as the recorder.
A more challenging instrument such as a violin, cello, flute or piano often follows, and this learning experience helps children develop the widest possible range of productive musical skills and benefit from practical experience.
From class 5 onwards, the intellectual understanding of musical experiences gradually becomes more conscious with the first steps in musicology and from class 8 or 9 onwards, young people learn about music culture in as many respects as possible. They learn about the historical genesis of musical creation up to contemporary music. It is important for them to be able to analyse contemporary popular music and also to understand the function of film music in creating a film plot.
Research on a topic can also lead to the production of a radio feature that can then be broadcast on a local radio station.
Theatre projects, especially the class plays in class 8 and 12, greatly expand language skills as well.

| **Baselines of a media educational concept:** | **Media form: image** |
|---|---|
| Pre-school | Painting with wax crayons or watercolours. |
| Class 1<br>Age 6 – 7 | Painting with watercolours & coloured pencils. Form drawing.<br>Learning colour tones. |
| From class 2 or 3<br>Age 7 – 9 | Drawing illustrations.<br>Increasing differentiation of the image design. |
| From class 4 or 5<br>Age 9 – 11 | Increasingly more exact drawing, e.g. within scope of botany and zoology. |
| Class 6<br>Age 11 – 12 | Beginning of the theory of projections and shadows.<br>Learning the laws of perspective through practical tasks.<br>Camera obscura. |
| Class 7<br>Age 12 – 13 | |
| Class 8<br>Age 13 – 14 | |
| Class 9<br>Age 14 – 15 | Painting and drawing at higher skill levels.<br>Getting to know the language of photographic and cinematic pictures from practical experience.<br>Creating one's own film.<br>Analysing films and advertising. |
| Class 10<br>Age 15 – 16 | |
| Class 11<br>Age 16 – 17 | Digital image processing from an artistic point of view. |
| Class 12<br>Age 17 – 18 | |

# Media form: image

Great importance is attached to the best possible mastery of writing. However, there is not the same awareness that the media-form "image" must also be "read". Just as children learn to understand texts, they also need to know how statements in pictures and images come about and how they can be understood.
A curriculum oriented to the children's development begins with young pupils first learning to create pictures through their own (analogue) artistic activity. This begins in the pre-school period by painting simple motifs with coloured pencils, wax crayons or watercolours. This practice is continued throughout the early school years, when children are able to develop an aesthetic sense. They learn to distinguish between different shades and colour tones and to judge them aesthetically. As the children grow older, their own paintings and drawings become more differentiated and diverse. At around twelve years of age (class 6), the laws of projection and shadow theory are introduced. On the basis of specific drawing problems, pupils learn to handle the laws of perspective in a practical way. In class 11, this practical understanding is taken up and mathematically deepened in the context of projective geometry.
By means of self-made stop-motion films, the principle of moving pictures and especially animated films can be experienced from class 5 onwards. Starting with class 9, it is useful to get to know the language of photographic and cinematic images, again by means of specific hands-on projects. The aim is that by making their own films, adolescents learn to analyse and understand the procedures of professionally produced films. It is also important that young people should understand the structure and function of advertising.
Starting in class 11, it makes sense for young people to learn how to extend the creativity they have acquired in art classes over the years by applying analogue techniques to digital technologies. Digital image processing, from an artistic point of view, grows organically out of art lessons.

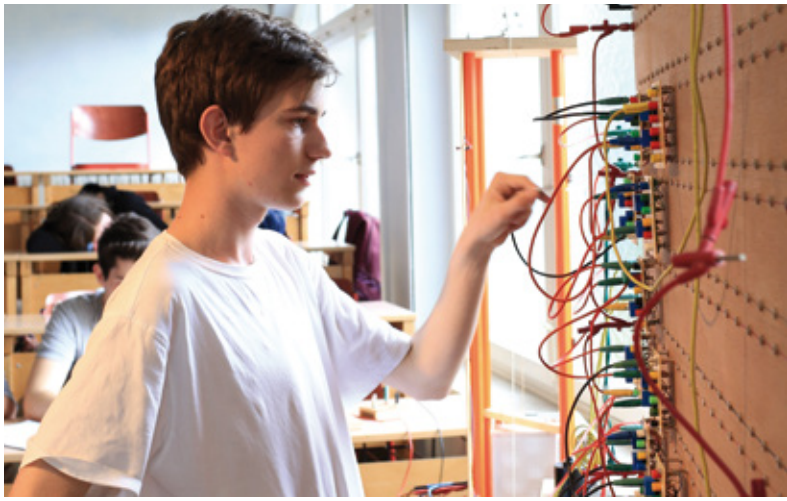
| **Baselines of a media educational concept:** | **Media carrier** |
|---|---|
| Pre-school | |
| Class 1<br>Age 6 – 7 | |
| From class 2 or 3<br>Age 7 – 9 | Manufacture paper. |
| From class 4 or 5<br>Age 9 – 11 | |
| Class 6<br>Age 11 – 12 | "Media driver's license". |
| Class 7<br>Age 12 – 13 | Practical bookbinding. |
| Class 8<br>Age 13 – 14 | Working with microphone and camera. |
| Class 9<br>Age 14 – 15 | Getting to know the dual system in mathematics. Learning to understand the basic functioning of the telephone. |
| Class 10<br>Age 15 – 16 | Logical circuits, getting to know the basic structure of a CPU.<br>Historical and cultural aspects of IT technology. |
| Class 11<br>Age 16 – 17 | Coding. Programming of microcontrollers, such as Arduino. Radio technology up to mobile radio. |
| Class 12<br>Age 17 – 18 | Data transmission in the network.<br>"Big data".<br>Basic ideas of neural networks and artificial intelligence. |

# Understanding media carriers

It is a basic intention of Waldorf education to convey an understanding of the principles of everyday technology. From the very beginning, Steiner/Waldorf schools have taught the functional principles of important everyday devices based on motor technology, communication technology, screen technology, etc., in physics lessons and also in a specially established "technology class". In the mid-1980s, Waldorf teachers were beginning to look for ways of efficiently integrating the subject of computers in the curriculum. Since that time, most Steiner-Waldorf schools have been teaching about computers and computer technology from class 9 onwards.

In many Steiner/Waldorf schools, the introduction to computer technology is based on the practical use of electronic components and devices. This means, for example, that from class 9 or 10 onwards, the pupils build and examine basic circuits of computer technology (NOR, OR, NAND, AND, half adder, full adder, flip-flop etc.) with the help of relays or transistors during a practical teaching block, in order to subsequently figure out the functioning of microprocessors. In class 11, a practical programming course has been included in the timetable of many schools.

The basic concern is to show how the machine "computer" translates formalizable human logic into a sequence of physical state changes. This must also include an understanding of how neural networks work, so that students can acquire a sound basis for assessing the possibilities and limitations of so-called "artificial intelligence".



# “Computer driving license”

Starting from the transition to puberty, it is the developmental task of growing young adults to leave the sheltered space of childhood, to expand their radius of action, and to move more and more independently in the world. Representative studies in Germany[4] show that this also applies to media behaviour. Children around the age of 12 are shifting their media preference from television to computers and the internet, and are moving largely around the internet on their own. That is why it is important at this age for children to obtain a kind of “computer driving licence”. The basic didactic goal is to start with the development of *media awareness* for this adolescent group. Such awareness is the ability to distinguish between reality and fiction, including, above all, the insight that the virtual online world and the real “offline world” have some different rules.

In addition, it is extremely important that children possess a basic understanding of how to navigate the internet in a data-secure manner while at the same time realizing what the real consequences of misconduct in the digital arena can be.

The project “Analogue Social Network” in the protected space of a class can be a good preparation for this task. Here the opportunities and risks of social networks can be experienced without screen media and internet. Topics include raising awareness for the protection of privacy on the net, writing short messages, the differences between one-to one communication compared to group chats, and recognising fake identities and fake news.

Of course, this group of young people need to know which search engines are available, how they differ from each other, and how one can use them for meaningful investigations.

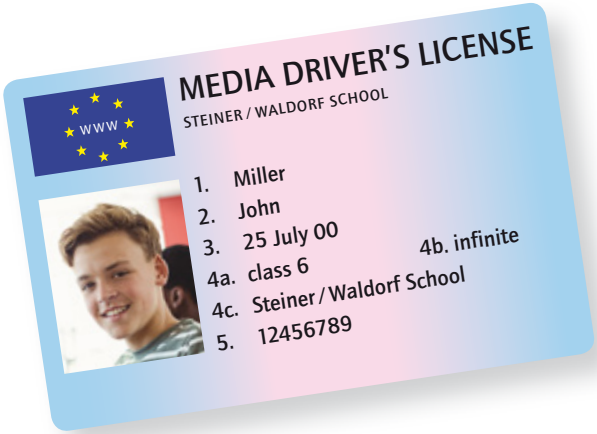
The “media driver’s license” should cover the following topics:

- Learn how to use search engines, get to know different search engines.
- Learn to judge the trustworthiness of internet sites.
- Friendly and appropriate behaviour with respect to contacts on the internet: security rules in chat, rules for dealing with social networks, “netiquette”.

4 https://www.br-online.de/jugend/izi/english/International%20Data%20on%20Youth%20and%20Media.pdf
https://www.apa.org/pubs/journals/releases/ppm-ppm0000203.pdf

- Cyberbullying: how do I deal with it if it happens, and whom can I turn to?
- Role of influencers and role models on the net.
- Protection of your own and other people's data.
- Publication of images on the web: rights and obligations.
- Information on copyright: what is protected, what is free, what uses of material are punishable?
- Criminal law: which publications are prohibited?

Learning can be done well in action-oriented learning environments. Accompanied research on the net for presentations creates meaningful learning opportunities to deal with different search engines and the trustworthiness of the results. Different themes, for example the explorers, can come alive and be experienced in the production of radio plays. Moreover, the question of personal rights and copyright arises in a meaningful and non-abstract way. In such and similar projects, adolescents acquire media knowledge and at the same time experience self-efficacy.




## Cooperation between parents and teachers

The great educator Janusz Korzcak (1878 - 1942) once wrote: "Let us have respect for the secrets and fluctuations of the hard work of growing up" that children perform. This work needs protection on the one hand, but also requires a variety of challenges that encourage the children to be active. Children need a stimulating and at the same time protective environment. This environment can only be created by parents and teachers working together. A fruitful cooperation between parents and school requires a common understanding of the stages of child development. We need opportunities to develop this understanding through discussion.

Parents often worry whether their children will become media literate during their school years. This legitimate concern can only be successfully addressed, if the school offers well-founded, direct media education instruction in addition to its previous teaching content from class 6 onwards.

On the part of the teachers, one often finds the concern that children to early on have access to devices, whose possibilities and, above all, whose seductions they are not yet capable of understanding. Intensive cooperation and discussions with parents in which such issues are addressed is therefore not only desirable but necessary. Developmentally appropriate media education should be a regular topic of parents' evenings and joint training courses for parents and teachers. It also makes sense to encourage the parents of different classes to make agreements about the age at which they furnish their children with what equipment and what rules apply when it comes to organising their children's leisure time.

The development of a sustainable, lively media education concept for the school is best achieved in a trusting atmosphere of cooperation between parents, staff, and students at secondary school level.

# The media educational concept in the context of a "competence framework"

For media education, there are a number of different frameworks in which the competences can be described:

- Operate and apply.
- Inform and research.
- Communicate and cooperate.
- Produce and present.
- Analyse and reflect.
- Problem solving and modelling.

For a competence framework oriented towards children and adolescents and their development, one can take a salutogenic viewpoint and start from the basic elements of the coherent experience. Then the desired abilities of the students are structured as follows:

**Understanding life.**

**Capacity to act & experience of self-efficacy.**

**Meaningfulness**

The following table arranges the topics that contain media educational aspects under this point of view. Once again, it should be remembered that a table forces dynamic processes into a rigid corset that can nevertheless be useful and thought-provoking.

## Understanding life

Technical understanding

Inform & research

Analyse & reflect

## Capacity to act & experience of self-efficacy

Communicate & cooperate

Produce & present

Solve & model problems

## Meaningfulness

Empathy

Sense of responsibility

Develop your own position

| | Understanding | | | |
|---|---|---|---|---|
| | Technical understanding | Information & research | Analyse & reflect | Communication & cooperation |
| Pre-school | Rhythmic games and materials not specifically designed for learning. | Experiencing nature. | Training of the senses. | Rhythmic games<br>Learning by example.<br>Solving conflicts through social interaction. |
| Class 1 and 2<br>Age 6 – 7 | Handling of tools. | Learning to write and read. | Understanding the environment primarily through action and emotional references. | Formation of a class community.<br>Writing and reading, story-telling, making music together and eurythmy. |
| Class 3<br>Age 7 – 9 | House-building block.<br>Agriculture block.<br>Handicraft block. | Visits to craftsmen-workshops.<br>Set up and use class library. | | Deepen writing and reading skills.<br>Project lessons such as house-building block. |
| Class 4 and 5<br>Age 9 – 11 | Flipbook.<br>Shadow theatre. | Use the school and city library to prepare talks.<br>Experience local history through excursions. | | |
| Class 6<br>Age 11 – 12 | Physics: optics, acoustics and camera obscura.<br>Art: projection and theory of shadows.<br>ICT: Understanding search engines, privacy settings. | Get to know museums.<br>Conduct interviews. | First elements of algorithmic thinking with computer science unplugged: analogue coding. | Analogue social network. |
| Class 7<br>Age 12 – 13 | | | Newspaper main lesson block – get to know different journalistic forms.<br>Analysis of photographs – get to know and handle image design elements. | |
| Class 8<br>Age 13 – 14 | Basics of word processing and layout.<br>Understanding digitalisation, Bits and Bytes and Image compression. | Research for the 8th grade project in libraries and on the Internet. | Evaluate the reliability of sources.<br>Reflect on the own media behaviour. | Structure of an application letter, curriculum vitae, business mail. Netiquette, hate speech, commentary and evaluations. |
| Class 9<br>Age 14 – 15 | Binary numbers in mathematics. Basic functionality of the telephone, analogue and digital. Audio editing. | E.g. history: Researching local history in archives, conversations with contemporary witnesses. | Recognize the significance of free media for democracy.<br>Develop quality criteria for good design. | Digital communication with partner schools.<br>Collaborative work on the net: Wikipedia, Padlet, Open-streetmap etc.<br>Project organization with digital tools. |
| Class 10<br>Age 15 – 16 | Basic structure of a CPU.<br>Browser security settings.<br>Security in the internet. | The importance of editorial selection; history of film. | Be able to assess the seriousness of digital materials, recognize the power of media design tools. Film analysis, technical, aesthetic and social aspects of film history. | |
| Class 11 and 12<br>Age 16 – 18 | Radio technology up to mobile communications. Digitization of voice and multiplexing. | Scientific research for papers and presentations. | Detect manipulations: fake news, framing, trolls. Social role of media companies. Big data and surveillance. | |

| Doing | | Meaningfulness | | |
|---|---|---|---|---|
| **Producing & presenting** | **Solving & modelling problems** | **Empathy** | **Sense of responsibility** | **Develop own position** |
| Painting. Singing. Role playing. | Everyday learning from appropriate adult examples. | Listening to fairy tales and stories. | Accompanying the everyday tasks of adults. | Learning by example. |
| Reciting, singing, drawing shapes, painting, designing copybooks, public class performance, handicrafts. | Developing problem-solving skills through work in craft and artistic areas. | Listening to and retelling legends and myths. | Class tasks. Caring for plants and animals. | Judgements especially on an emotional level. |
| Class orchestra, class choir. | | To make conscious and strengthen relationships with the world, e.g. craft block. | Actions for the common good. | |
| Presentations supported mainly by analogue media and real things. | | Deepen relationships with the world in the ecological and historical sense, e.g. animal studies. | Horticulture. Guided planning of parties and excursions. | |
| Write articles for the student newspaper. Record radio plays and reports. | Appropriate handling of problematic media behaviour and inappropriate content. | Discuss cyber-mobbing. | Responsible handling of personal and external data and images. Learn to protect privacy. Know personal rights and copyrights. Learn to follow your own actions on the net. | Training of the argumentation ability; learning to lead objective debates. |
| Learn to master the ten-finger typing system. Bookbinding. | | Develop netiquette. Recognize and evaluate hate speech. | | |
| Use a word processing program sensibly; create reports digitally. | Theatre project: Advertising, organization, scenery and costumes, sound engineering and sound reinforcement. | | "Think first, then click." | Reflect own media behaviour. |
| Be able to apply graphic design. Create student exchange blog. Film/sound processing and audio editing. Creating audio and video productions. Learning to understand logical circuits practically. Building an adder from half and full adders. Making movies. | Create explanatory films. | Work and agricultural internship. | | Develop cell phone rules together. |
| | Mechanics, e.g. Rube-Goldberg machine. Field fairs. Programmin/coding. Reproduce processes algorithmically. | Poetics block possibly in cooperation with artistic subjects. | Raising awareness of one's own contribution to social aspects of computer technology. | Self-determined media usage times. |
| Present lectures in a targeted and audience-oriented manner. Using media technology sensibly. | Plan and write papers and plan and carry out projects, overcome difficulties. | Social internship. Aspects of sustainable development. | Man and machine: Know the effects of artificial intelligence, the "internet of things" and act accordingly in a self-determined manner. | |

| | Understanding | | |
|---|---|---|---|
| | Technical understanding | Information & research | Analyse & reflect |
| Pre-school | Rhythmic games and materials not specifically designed for learning. | Experiencing nature. | Training of the senses. |
| Class 1 and 2<br>Age 6 – 7 | Handling of tools. | Learning to write and read. | Understanding the environment primarily through action and emotional references. |
| Class 3<br>Age 7 – 9 | House-building block.<br>Agriculture block.<br>Handicraft block. | Visits to craftsmen-workshops.<br>Set up and use class library. | |
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| Class 6<br>Age 11 – 12 | Physics: optics, acoustics and camera obscura.<br>Art: projection and theory of shadows.<br>ICT: Understanding search engines, privacy settings. | Get to know museums.<br>Conduct interviews. | First elements of algorithmic thinking with computer science unplugged: analogue coding. |
| Class 7<br>Age 12 – 13 | | | Newspaper main lesson block – get to know different journalistic forms.<br>Analysis of photographs – get to know and handle image design elements. |
| Class 8<br>Age 13 – 14 | Basics of word processing and layout.<br>Understanding digitalisation, Bits and Bytes and Image compression. | Research for the 8th grade project in libraries and on the Internet. | Evaluate the reliability of sources.<br>Reflect on the own media behaviour. |
| Class 9<br>Age 14 – 15 | Binary numbers in mathematics. Basic functionality of the telephone, analogue and digital. Audio editing. | E.g. history: Researching local history in archives, conversations with contemporary witnesses. | Recognize the significance of free media for democracy.<br>Develop quality criteria for good design. |
| Class 10<br>Age 15 – 16 | Basic structure of a CPU.<br>Browser security settings.<br>Security in the internet. | The importance of editorial selection; history of film. | Be able to assess the seriousness of digital materials, recognize the power of media design tools. Film analysis, technical, aesthetic and social aspects of film history. |
| Class 11 and 12<br>Age 16 – 18 | Radio technology up to mobile communications. Digitization of voice and multiplexing. | Scientific research for papers and presentations. | Detect manipulations: fake news, framing, trolls. Social role of media companies. Big data and surveillance. |

# Understanding

"What you have learned to understand, you no longer fear." This quote is attributed to the scientist and Nobel Prize winner Marie Curie. This is exactly what it is all about – understanding the media world in such a way that it is possible to move within it confidently.

What is important to understand in the media world? There is definitely the field of technology, but also the fields of politics, business and society. They are all represented in this curriculum.

Understanding has several levels. Some things we understand intellectually, others we have to grasp in other ways, i.e. experience through our senses, in order to understand them. Some things we have to actively experience ourselves by doing them. Waldorf education has always made use of all these forms of learning, so it is natural to also employ them for understanding the media, in each case according to age. In doing so, we start out from experiential actions before formulating what we have done conceptually.

To understand something profoundly, basic knowledge is required. In the technical field, children acquire this first and foremost in practical activities when they work with tools, build something, or plant a field. They experience how planning and work steps follow one another and how much effort goes into success. Thereby they also have their first very tangible experience of physics and mechanics. In middle school, the experience is joined by cognitive, theoretical knowledge, still derived from experiments. They can build on this foundation of experiential knowledge in the upper school classes when it is necessary to understand complex technical, but also economic and political systems such as big data or the role of large internet corporations.

Children and young people also need skills and strategies in order to understand content. They must learn where and how to find information – first in the analogue world, then in the digital world. And they must learn to evaluate and classify the information they find. School offers many occasions for doing this – presentations, homework, projects – and opens the horizon to a wide variety of sources, such as discussions with experts and contemporary witnesses, libraries, archives and databases, and of course qualified scientific research on the internet.

What children and young people learn and explore must be made their own by finding references to their own lives and generating meaning. This is achieved through analysis and reflection, and again through their own actions, in the spirit of Confucius:

*What you tell me, I forget.*
*What you show me, I remember.*
*What you let me do, I understand.*

| | Doing | | |
|---|---|---|---|
| | Communication & cooperation | Producing & presenting | Solving & modelling problems |
| Pre-school | Rhythmic games<br>Learning by example.<br>Solving conflicts through social interaction. | Painting. Singing.<br>Role playing. | Everyday learning from appropriate adult examples. |
| Class 1 and 2<br>Age 6 – 7 | Formation of a class community. Writing and reading, story-telling, making music together and eurythmy. | Reciting, singing, drawing shapes, painting, designing copybooks, public class performance, handicrafts. | Developing problem-solving skills through work in craft and artistic areas. |
| Class 3<br>Age 7 – 9 | Deepen writing and reading skills.<br>Project lessons such as house-building block. | Class orchestra,<br>class choir. | |
| Class 4 and 5<br>Age 9 – 11 | | Presentations supported mainly by analogue media and real things. | |
| Class 6<br>Age 11 – 12 | Analogue social network. | Write articles for the student newspaper.<br>Record radio plays and reports. | Appropriate handling of problematic media behaviour and inappropriate content. |
| Class 7<br>Age 12 – 13 | | Learn to master the ten-finger typing system.<br>Bookbinding. | |
| Class 8<br>Age 13 – 14 | Structure of an application letter, curriculum vitae, business mail. Netiquette, hate speech, commentary and evaluations. | Use a word processing program sensibly; create reports digitally. | Theatre project: Advertising, organization, scenery and costumes, sound engineering and sound reinforcement. |
| Class 9<br>Age 14 – 15 | Digital communication with partner schools.<br>Collaborative work on the net: Wikipedia, Padlet, Open-streetmap etc.<br>Project organization with digital tools. | Be able to apply graphic design. Create student exchange blog. Film/sound processing and audio editing. Creating audio and video productions. Learning to understand logical circuits practically. Building an adder from half and full adders. Making movies. | Create explanatory films. |
| Class 10<br>Age 15 – 16 | | | Mechanics, e.g. Rube-Goldberg machine. Field fairs. Programmin/coding. Reproduce processes algorithmically. |
| Class 11 and 12<br>Age 16 – 18 | | Present lectures in a targeted and audience-oriented manner. Using media technology sensibly. | Plan and write papers and plan and carry out projects, overcome difficulties. |

# Doing

To experience that my own actions have an impact makes me strong. It means that I can make a difference, that I can master difficult tasks by my own efforts. Self-efficacy is the pedagogical term for this – it is the second pillar of the sense of coherence. When do children and adolescents experience that their actions make a difference, can change the environment? And how can educational "doing" open up such spaces of experience?

Children and adolescents need age-appropriate challenges where they can develop their problem-solving skills and experience a sense of achievement. In the lower school classes, these challenges include craft and artistic tasks; in the middle school a year-long work project, theatre projects and much more; in the upper school classes, this includes challenges such as student companies, time spent abroad, etc. At the same time, it is important that adults set an example of self-efficacy expectations and problem-solving strategies, that they motivate young people in their learning, and that they trust them to master the tasks they are given, and not take them off their hands.

The world of media is man-made, it can and must be created by people. Thus, it is very empowering for children and young people to experience their own effectiveness in the media by creatively designing media: producing podcasts, making films or writing school newspapers and blogs. They experience the power – and thus also the responsibility – to help shape "the media" and to use it as an expression of their feelings and ideas.

Doing never takes place in a vacuum. Those who act always move in social relations. Doing-oriented learning is therefore always also a training ground for social learning, i.e., dealing with other people, other opinions, and other ideas. And thus, it is important to develop empathy and conflict resolution skills in real life, in order to be able to deal adequately with one's own and other people's comments, or to confront hate speech, trolling, bullying or harassing on the internet later. And, of course, it is all about knowing and mastering the tools of communication – from CVs to collaborative project management tools.

Self-efficacy is the basis on which children, and later adults, can creatively and responsibly contribute to their living environment and the media world, both privately and professionally.

| | Meaningfulness | | |
|---|---|---|---|
| | Empathy | Sense of responsibility | Develop own position |
| Pre-school | Listening to fairy tales and stories. | Accompanying the everyday tasks of adults. | Learning by example. |
| Class 1 and 2<br>Age 6 – 7 | Listening to and retelling legends and myths. | Class tasks.<br>Caring for plants and animals. | Judgements especially on an emotional level. |
| Class 3<br>Age 7 – 9 | To make conscious and strengthen relationships with the world, e.g. craft block. | Actions for the common good. | |
| Class 4 and 5<br>Age 9 – 11 | Deepen relationships with the world in the ecological and historical sense, e.g. animal studies. | Horticulture.<br>Guided planning of parties and excursions. | |
| Class 6<br>Age 11 – 12 | Discuss cyber-mobbing. | Responsible handling of personal and external data and images.<br>Learn to protect privacy. Know personal rights and copyrights.<br>Learn to follow your own actions on the net. | Training of the argumentation ability;<br>learning to lead objective debates. |
| Class 7<br>Age 12 – 13 | Develop netiquette.<br>Recognize and evaluate hate speech. | | |
| Class 8<br>Age 13 – 14 | | "Think first, then click." | Reflect own media behaviour. |
| Class 9<br>Age 14 – 15 | Work and agricultural internship. | | Develop cell phone rules together. |
| Class 10<br>Age 15 – 16 | Poetics block possibly in cooperation with artistic subjects. | Raising awareness of one's own contribution to social aspects of computer technology. | Self-determined media usage times. |
| Class 11 and 12<br>Age 16 – 18 | Social internship.<br>Aspects of sustainable development. | Man and machine: Know the effects of artificial intelligence, the "internet of things" and act accordingly in a self-determined manner. | |

# Meaningfulness

Decades ago, the psychologist Viktor E. Frankl (1905-1997) discovered that many phenomena of society can be explained by the image of the mental vacuum, the absence of meaning. When asked how to find meaning in life, he replied:

"What was really needed was a fundamental change in our attitude toward life. We had to learn ourselves and, furthermore, we had to teach the despairing men, that it did not really matter what we expected from life, but rather what life expected from us.[5]

Frankl points out that one must develop a sense of purpose in life to find the meaning of one's own existence. A personal sense of meaning presupposes a sense of the foreign. A Sense in life arises when one can experience one's own actions in a context with other people, when one can be active in life. This presupposes a way of thinking that does not merely look at individual references, but at more comprehensive wholes in which the details are embedded.

Children need to experience meaning. For them, the relationship of a thing to themselves is primarily important. They need to be able to see the meaning of what they are learning by establishing a relationship to their teachers and the content of what they are teaching. In the first years of school, this relationship is deepened, for instance, through storytelling and learning through example. Fairy tales, myths and legends simultaneously convey values and thus an understanding of the world.

In the course of schooling, the development of empathy must be encouraged. It opens the children's understanding of people and the world. They begin to develop their own interest in the world through craftsmanship, local history and animal studies. The young person gradually develops a sense of the world. At the same time, children and adolescents gradually take on more and more responsibility for their own actions in this world, starting with everyday tasks such as classroom duties and extending to the responsible handling of their own and other people's data on the internet. The resulting deeper insight into overarching contexts in the course of their school years forms the basis for the development of their individual position in the world. In the training of objective judgment in adolescence, individuals gradually go beyond their own state of mind and recognize the questions of the world and their own specific responsibility, while at the same time experiencing the meaning of what they are doing.

5 Frankl, Viktor (1988): *Man's search for Meaning Munich*, Frankl, Viktor, (1988),Washington Square Press

# Media education at Waldorf Schools – Equipment

**In the next pages, we would like to provide you with criteria for the right hardware selection based on previously discussed media education aspects as well as on experience gained and collected in Steiner/Waldorf schools in corresponding specialised lessons. We do not give direct references to types of equipment or specific software since this may vary from country to country**

## INTERNET CONNECTION

Many roads lead to Rome. However, when it comes to properly connecting the school to the internet, the maxim that "more is better" applies. A broadband connection with optical fibre is preferable in any case; the booked bandwidth does not have to correspond to the technically possible one, but a later increase is then possible without problems. There is nothing to prevent different user groups (students, administrators, teachers) from being connected together if the school is divided into clearly separated networks. With an optical connection, the school is best prepared for future requirements. If only DSL is available, a high bandwidth should be ensured. At some locations, local providers also offer radio links; these are often significantly more expensive than other forms of connection and only make sense where there is no other option.

## NETWORKS INSIDE THE SCHOOL

Particularly in the case of new buildings, extensive cabling for IT should be provided from the beginning. As far as feasible, empty conduits with cable feed or conduits for blowing through fibres are the better and more future-proof choice. Retrofitting in existing buildings is often difficult and expensive; empty conduits are also an advantage here, but often not feasible. Between buildings we recommend the use of optical fibres. If there are sub-distributors on the floors, fibre optic connections between the distributors are the better choice. A copper cable (minimum Cat 7) to the classrooms is sufficient. We recommend supplying each classroom and always using at least two parallel cable strands. If mobile devices are to be used, the power supply should also be ensured. In workrooms with fixed PC workstations, science rooms, etc., a cable pair should be laid to each workstation and a sub-distribution unit should be set up in each respective room. Whenever cables are laid, care should be taken to ensure high-quality work and proper documentation of the network; if necessary, the technicians should submit measurement logs of the connections after completion of the work.
As switches, we recommend managed devices that offer options such as VLAN, MAC filters etc. In structured wiring, for example, it is recommended to set up a sub-distribution on each floor. The necessary 19" cabinet should provide enough space for patch panels, electrical switches and, if necessary, an uninterruptible power supply.

### Server

Small personal servers or virtual in-house servers are a basic requirement for many applications. The trend to outsource school networks to the cloud is clearly favoured in some countries, but the standardisations and solutions there are less suitable for Steiner/Waldorf schools. A tailored infrastructure remains indispensable. Of course, this also means that the maintenance effort remains in the school, so that care and maintenance must be calculated as follow-up costs.

### User management

Every IT infrastructure must be sufficiently secured. A user management system is therefore essential and should be installed on the school's servers. School e-mail addresses and separate user accounts for teachers should be standard practise today.

### Wi-Fi

As an alternative to complex cabling, Wi-Fi is also repeatedly discussed as a networking element. Basically, we do not recommend Wi-Fi. Apart from the discussion about the health-damaging consequences of WLAN, this radio technology also has considerable technical limitations. Wi-Fi would only make sense within classrooms without fixed cabling. If Wi-Fi is used, we recommend that it only be activated when needed, e.g. by a (teacher) key switch. Before doing so, you should consider whether Wi-Fi should also be enabled for private use; we advise against it. If the Wi-Fi is not to be used by private devices, technical precautions must be taken during installation to ensure that only the school's own devices can access the Wi-Fi. We do not recommend hobby solutions with access points from the electronics store. A Wi-Fi must support a central user administration with groups and access times and access protection.

As an alternative, a network connection via light "LiFi" can be considered. This technology should be available soon.

## CLASSROOM EQUIPMENT

In the Waldorf context, the complete replacement of the traditional chalkboard is unthinkable. In many cases, the first presentation and processing of classroom material could not be realised digitally at all, or only poorly. In addition, with electronic technology there is always the possibility of failure: in these situations, a good old-fashioned blackboard is immensely helpful. In middle school, but above all in the upper school classes, it is recommended that classrooms be equipped with a projector and sound reproduction. Short-distance projectors can be permanently installed and set so that they do not disturb other forms of teaching. In addition to the classic blackboard, we recommend a whiteboard for projector use, which should be installed next to the black board so that both media can be used at the same time. If such an arrangement is not possible, a permanently installed screen should be provided, if possible one with an electric motor. A projector must have sufficiently powerful brightness and, if possible, not require any separate darkening of the room for use.

LED projectors are the technology of the future; they are easier to maintain, quieter and smaller than projector with halogen light. Fixed cables from the projector to the teaching station (HDMI) must be provided. In addition, several sets of adapters for all possible playback devices (laptops of all brands, tablets, DVD players, etc.) must be kept in a central location so that teachers can use their own equipment. A freeze function for the image, controlled via a remote connection, allows for short fades and changes of content without switching off the projector completely. Alternatively, a (mobile) multi-touch display can be used. A sound system should produce a good quality of sound that is also sufficiently loud. This includes at least two good speakers and usually a separate amplifier. Most projectors do not meet these requirements, despite boastful product specifications. If required, a DVD player, or better yet, a BluRay player, can also be provided.

### Document cameras

Document cameras, in combination with a projector, are a useful extension of the classroom, as student solutions or sketches, for example, can be easily shared with everyone. In any case, a stable model is recommended, one that can be operated without a computer.

Do-it-yourself boxes

Not only in computer working groups, but also for whole classes, a good technical education can provide the necessary foundation for a solid knowledge of computer science and media. Starting with simple soldering work to develop basic circuits, building an elevator controller or an analogue telephone (alternating and direct current, pulse generator), through simple programming and controlling with Arduino, Raspberry Pi and the use of construction kits for building robots (e.g. Lego Mindstorm), computer technology can be made very accessible to young people.

### PC room or mobile

More and more schools are moving from fixed installations with PCs to mobile solutions with laptops. However, the new flexibility requires either installed cables to each workstation in each classroom where such devices are used, or WiFi must be installed in the classroom. In addition, a transport trolley that can load the laptops at the same time when they are placed on the shelf is advisable. It must be possible to travel between rooms with the trolley without difficulty.

### Laptop or PC

Laptops offer several advantages over classic PCs: they save space, can be used in various different rooms, can be used outside of school (if needed), and are better protected against hardware manipulation. Another advantage is that they can be closed when something is being explained, which creates a completely different communication situation in the classroom than when everyone is sitting behind screens. However, PCs also have advantages: they are easier to expand, easier to repair, and a little cheaper to buy. For sound and image processing, laptops like PCs should have good monitors, speakers, headphone jacks, as well as a keyboard and a mouse. When purchasing laptops, we recommend models with a built-in network port (Ethernet) so that you don't need adapters when using cables.

### Tablets

In our opinion, tablets are generally unsuitable for teaching in the early grades. While finger operation on the screen makes it easy to retrieve information, swiping and typing is not suitable for further processing. Since the use of educational software in schools is generally not practical, there are hardly any scenarios left for using tablets as teaching aids that would justify the high price and low flexibility with a short life span. There is, however, one exception: as media processing devices in the middle and upper school, the use of tablets can make sense.

### Printers

A network-compatible printer with a fixed installation should be provided in every PC room. Inkjet printers have the advantage over laser printers, that there is no particle emission.
A printer should be secured against excessive use either technically or by supervision.

### Robots

There are now many different robot systems which are suitable for teaching situations. The pedagogical benefit of programming for instance a moving robot as opposed to programming a virtual moving robot on the screen is that a real vehicle, which may then hit a table leg or follow a drawn line, leads to far greater motivation and livelier interaction among students. Sensors are also available for many devices, so that even more demanding tasks can be programmed.

### 3D Printers

Working with 3D printers allows students to practice structured procedures and spatial perception when using a programming language in which the objects to be printed are composed of geometric shapes. Then the programming power lies, for example, in building a house with windows or doors from various basic geometric shapes such as cuboids or pyramids through optimal combinations. The actual creation of an object in the real world offers the students a more powerful experience than just working on the screen.

### Operating system

Separate worlds and ideologies differ concerning the question of the right operating system. While Windows and Mac OS come from IT companies, Linux is very popular among advocates of free software. Windows serves as the basis for many programs and is therefore indispensable in an IT environment. However, with careful planning and good maintenance, a large part of school requirements can be very well covered by Linux. In the school environment, commercial products such

as Windows, Word, etc. are available at favourable delivery conditions; Linux, in contrast, is completely free of charge, but requires more attention from an expert. A parallel installation of Linux and Windows is technically quite simple, but the maintenance effort is doubled. If a network connection of the end devices can be ensured with cables, a solution with ThinClients makes sense. Updates and upgrades then only have to be carried out on the central server, and there is no need to update the individual end devices. In principle, we recommend installation by commercial experts, otherwise the workload on teachers is too great.

## Software

There are now countless software offers for all areas of application. In principle, free software, if available, should be used for educational purposes, and the concept of free software should be discussed with the students.

## Writing, typesetting

In the field of word processing, two programs are widely used: the free LibreOffice, or OpenOffice and Word from Microsoft. In school use, LibreOffice is to be preferred, since the pull-down menus logically reflect the structure of a text, while the buttons in Word must be learned by heart and it is difficult to obtain an overview of all functions. The free products run under Linux Mac OS and Windows, Word only under Windows. In terms of functionality, none of the text products has an advantage; the same applies to the spreadsheets of the office packages. In the area of databases, however, there are significant differences. But the use of databases only makes sense for the more advanced students in a class, and then free software databases also have great appeal. There are also good free programs for layout work, while the commercial tools are quite expensive for schools. In professional fields, the free tools with a smaller range of functions are a disadvantage, but this should not be too serious a disadvantage in schools.

## Programming

Programming languages and environments are incredibly diverse and varied. There are numerous solutions for every platform. Visual programming languages like scratch offer a quick start, but the process of analysing the given problem is still necessary.
Getting started with programming is more tedious over classic, text-based development environments, but in the long run it is advantageous. There are also programming environments based on a so-called "educational-programming-language", e.g. "Karel, the gentle robot". Here, too, structured programming can be practiced in one's native tongue, and a concrete task in contrast to the rather abstract objects of a classical programming language is easier for many students. These programs are thus particularly suitable for the introduction to programming.
More complex but also more powerful languages such as Java, C++ and others introduce the student to the underlying logic of IT without focusing on quick and usually colourful successes. In the free Linux world, there are also well-established programming environments as in the Windows world. In principle, Linux solutions are very useful and available free of charge, but require well-trained teachers. The Waldorf approach to programming, to go from the phenomenon via observation to comprehension and abstraction, should also be implemented as effectively as possible.

## Maintenance contracts

Any infrastructure will relatively quickly require a considerable amount of maintenance time and expertise. Minor compensation hours for teachers or a few hours of voluntary work provided by parents will not suffice. Adapted maintenance contracts are thus often indispensable and must be provided to support the teachers in their work.

## Learning software

Educational software in most cases follows the idea of the classic textbook, both in the presentation of content and linearity. Thus, the software often asks for results in a multiple-choice form. The selective use, i.e. in suitable sections, of the learning software is even less possible than in a textbook. Standard learning software is hardly or not at all suitable for Waldorf contents and didactic approaches. The usual learning software options make the question of using textbooks at Steiner/Waldorf schools even more acute. As a rule, such software comes at a cost and requires permanent updates and maintenance. Certain programs for presenting and clarifying certain subjects, such as geometry software or pronunciation aids for foreign languages, are suitable for Waldorf schools.

## Active media work

Making films, producing podcasts, writing blogs – this is how young people artistically and creatively design digital space, sharpen their perception, experience self-efficacy and develop aesthetic sensitivity. Processing digital media gives young people an understanding of such media work and also vividly illustrates the media's effect up to and including manipulation, without any specific moral appeals. In addition to actual sound editing, the basics of sampling, digital conversion, compression, storage and then the way back to original formats can be taught. It makes sense to start with the medium of "sound", and only to switch to the more complex process of video editing after students have mastered the use of audio editing software. Basically, we can assert that there are countless, very different educational applications for audio and video in the classroom, and the technical requirements are correspondingly diverse.

Sometimes it may be advisable to purchase used equipment for cost reasons; one does not always have to use the current or latest updated model. For class projects, it makes work much easier if several identical devices are available. If there is a hodgepodge of different devices, the explanation and maintenance effort increases and more errors occur.

## Bring your own device

Often "bring your own device" is propagated, i.e. working with the smartphones of the students, which now have good cameras and apps for media editing. The advantages include low to no acquisition costs and always more or less current models. In addition, young people are familiar with their own devices and thus learn to use them artistically and creatively beyond the classroom. However, in our view, the disadvantages outweigh the benefits for use in school – a smartphone is not just a camera or microphone, it also allows social networks and games to enter the classroom, and there is a high risk of distraction. Using one's own devices, on the other hand, can be useful for homework or presentations.

The use of an external microphone is essential for the production of video and audio. There are models with cable – well suited for video interviews where the camera needs to be positioned further away from the sound source – or clip-on microphones, which are suitable for pure sound recording.

## AUDIOPRODUCTION – AUDIO DRAMA, SCHOOLRADIO, PODCASTS

### Recording: Studio situation

In an acoustically suitable room, a microphone (with pop protection if possible) is placed on a tripod and connected to a computer via an audio interface. This is suitable for scenic works, radio plays, and music recordings. Basically, there are two different types of microphones, both available with different directional characteristics.

- Dynamic microphones
  Dynamic microphones can handle high sound levels, so they are used where high sound pressure levels are expected. However, they also react somewhat sluggishly to incoming sound. Dynamic microphones do not require an additional power supply.

- Condenser microphones
  These need power, either batteries or phantom power. They react more sensitively and deliver a more differentiated sound image.

- Cardioid characteristic
  A cardioid microphone picks up mainly what happens in front of it and, depending on its "width", next to it. Noise and background noises from the side and from behind are faded out as much as possible.

- Omnidirectional characteristic
  An omnidirectional microphone picks up sound from all directions.

- Directional characteristics
  This is the classic directional microphone and is mainly used when the sound source is further away

### Mobile Recording

Portable recording devices allow you to record sounds, sound scenarios, interviews, reports and theatrical scenes anywhere. Important criteria for the purchase:

- The device should record in uncompressed linear audio "wav" format.

- Ideal for use in schools are devices with externally rechargeable batteries, of which a sufficient number can always be kept in reserve.
  Also helpful for use in school:

- Recording on a standard SD card, which students can take with them for further processing while the next group is already using the device with the next SD card.

- Clear display, simple menu navigation.

- A built-in loudspeaker is useful to allow the group to listen to their recordings together for control purposes; a headphone jack is indispensable.

- A windscreen and headphones should always be included when recording.

### Sound Editing / Editing-Cutting Mix

The open source software Audacity is very well-suited for use in schools. For more complex projects, Reaper or Hindenburg Journalist, for example, can be used. A headphone splitter is also helpful when several groups in a room are working on audio together, so that several headphones can be plugged into one computer.

## VIDEO PRODUCTION – FEATURE FILMS, ANIMATED FILMS, DOCUMENTARIES

A few words about tablets. They are very easy to use and offer many creative possibilities through a variety of apps. In particular, the possibility of drawing directly with a pen in photos or videos or of recording the drawing process simplifies the production of explanatory videos as well as video art. Green-screen recordings, stop-motion movies and visual effects are easy to achieve with corresponding apps. Recording and editing is done in the same mobile device, which gives young people a great deal of autonomy over their work – they can take it with them and work wherever they choose.

Tablets do a lot automatically – the technical and physical processes take place in the background and are not transparent. Due to the small aperture, tablet cameras have weaknesses in depth of field, pinched zooms are rarely smooth. If you want to set aperture, exposure time, sharpness and ISO yourself, you need appropriate apps. The more demanding the projects become, the faster tablets reach their limits in both the recording and editing areas.

Cameras are available in all price and quality levels. It is important to carefully consider for which purpose they are to be used and to find the right balance between simple and intuitive operability on the one hand and creative possibilities and transparent technology on the other. Cameras that offer the possibility to switch between automatic and manual operation are recommended. An image stabilizer is helpful, but ideally it should also be possible to switch it off.

### Camcorder

Resolution is decisive for the quality of the image. Even relatively inexpensive cameras can now handle HDV (1280 x 720 or 1440 x 1080 pixels). Full-HD with up to 1920 x 1080 pixels is better.

So-called CCD (Charged Coupled Device) chips convert the image into digital data. A 3CCD camera has a separate chip for each of the three basic colours: red, green and blue, thus producing significantly better images than do single-chip cameras, where the three colours share one chip.

### Photo cameras

Digital single-lens reflex cameras (DSLR) are suitable for filming and produce pictures with beautiful depth-of-field effects that are reminiscent of the aesthetics of pictures taken with expensive cinema cameras. Many bridge and system cameras also provide excellent images. For more demanding productions, it is helpful to be able to change the optics, i.e. to utilise different lenses.

### Action cams

These are small and light, water and shock resistant. They can be attached to a helmet, bicycle, etc. and are suitable for first-person shots of anything that moves, but the wide-angle lens can be a disadvantage.

## Accessories

To take pictures in often unfavourable lighting conditions at school, you need fast cameras and/or a light case or at least a head light. Light is an essential design element in filming.

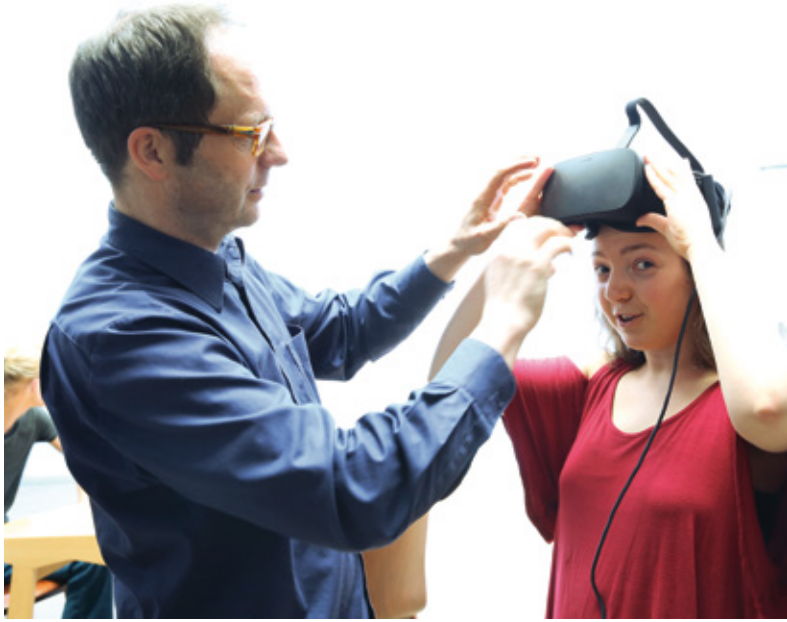
Tripods ensure wobble-free images and are a must on the procurement list. Photo tripods are unsuitable because they usually do not have a pan head that ensures jerk-free panning. Dollies are often easy to make yourself from anything that has wheels. For filming with smartphones, so-called gimbals, which compensate for the movements of the hand, are suitable.

Important: It must be possible to connect an external microphone and ideally to level its sound input manually. There are clip-on microphones for cameras, which record the ambient sound much better than the built-in ones, wired handheld microphones e.g. for reporter missions or interviews, sound fishing for scenes and – if the budget allows it – wireless radio links.

## Editing / post-production

A good option for simple productions is the open-source software Open Shot. For tablets, a simple app (e.g. iMovie) is also included free of charge.

For more complex applications, professional programs such as Final Cut Pro X or Adobe Premiere are recommended, and manufacturers offer educational discounts.



# EPILOGUE

Two major waves of digitalisation have changed the very foundations of everyday life. The first wave crested at the beginning of the 1990s, when the development of the World Wide Web made the internet a "household" fixture and dominated the workrooms and studies in many homes by the end of the century. At the same time, mobile phones became suitable for the masses. Sales figures exploded. At the beginning of the new millennium, almost all households had a PC and a cell phone.

The introduction of the iPhone in the summer of 2007 marked the beginning of the second wave of digitalisation: the internet and mobile telephone came together. The internet found its way into people's pockets and became an omnipresent companion. A third wave of digitalisation is currently beginning now. In May 2017, Sundar Pichai, the CEO of Google, announced that the age of smartphone dominance would come to an end and that the age of artificial intelligence (AI) would begin: The "Mobile-First-World" will be replaced by the "AI-First-World". Digital devices will become the advisory partner of humans.

In fact, the development of AI technologies is already significantly advanced. If the current course continues unhindered, both the everyday lives of most people and the requirements for education and training will change fundamentally in the next 10 - 20 years. What will it entail to learn for life in the future?

The question of human education in a society shaped by digital devices goes beyond the question of how to use devices competently; education and upbringing should support the individual development of skills in such a way that every individual can lead a self-determined and fulfilled life and participate actively in society.

This point of view is given special attention in Waldorf education and therefore stands in contrast to other methodological views. For Waldorf education, the development of the human being in its wholeness is a central concern. The pedagogical space must therefore be designed in such a way that the human being is supported in the development towards self-competence and the person's ability to make judgements.
This view of the human being also implies an educational approach which doesn't exclusively focus on intellectual skills, but which also considers physical, sensory and emotional development to be crucial as well. The media educator Dieter Baacke who first introduced the concept of media competence, expressed a warning that has so far received little attention:

> *"The competence criterion can easily be narrowed down rationalistically. The physicality of a person or his/her emotionality is often not taken into account. On the contrary, these areas are first eliminated: [...]. Isn't there, as a matter of course, also a competence of humans to deal with their bodies appropriately?"*[6]

The extraordinary meta study by John Hattie,[7] published in 2008, and his further educational research extracts the results from about 80,000 individual studies. One of his central findings was that children are most stimulated to learn and best guided to educational

6 Baacke; Dieter (2007): *Medienpädagogik*. Tübingen, p. 100 [quotation translated from the German]

7 https://visible-learning.org/hattie-ranking-influences-effect-sizes-learning-achievement/

success by the personality of the teacher. He puts in a nutshell: "It's the teachers that matter."[8]
In his book "Digitale Bildung – Ein Widerspruch" (Digital Education – a Contradiction) (2018), the educational scientist Christian Rittelmeyer makes a detailed case for four indisputable and fundamental educational maxims: 1) There is a necessity for an all-around education, 2) education requires support and encouragement, 3) education must adjust to the world as it is today, 4) education must lead to independence. In this context, he also emphasizes the necessity of extensive artistic work in school. His book ends with the sentence:

> *"On the basis of the arguments presented here, digital education will be assigned a prominent but probably rather modest role in this broader educational horizon."*[9]

With regard to digitalisation it is not a question of throwing pedagogical experience and knowledge gained from the past overboard, nor is it a question of getting stuck in old forms that have simply become dear to us. It is a matter of "keeping centred": using the experiences and insights of the past to shape the present state of education in a new and contemporary way, so that children and young people will be able to find meaning and purpose in their lives and be well prepared to face the challenges that their futures will present.

The Corona epidemic has led to a huge surge in digitalisation. At the same time, however, it has been widely recognised that many things cannot be done well via computer and that extensive time spent at the computer also has many negative health consequences. Examples include a significant increase in depression and suicide rates among children and adolescents, in "zoom fatigue"[10] and short-sightedness[11]. This underlines our on-going efforts to promote a media-education which is age-appropriate and which reflects the actual needs of children and adolescents.

8 "The major message in this book is that enhancing teacher quality is one of the keys – and the ways in which to achieve this is through ensuring that every teacher in the school has the mind frame that that leads to the greatest positive effect on student learning and achievement." Hattie, J. (2012) *Visible Learning for Teachers. Maximizing impact on learning.* Routledge p. 191

9 Rittelmeyer, Christian (2018): *Digitale Bildung – ein Widerspruch. Erziehungswissenschaftliche Analysen der schulbezogenen Debatten.* Oberhausen, p. 153. [Quotation translated from the German]

10 https://www.bbc.com/worklife/article/20200421-why-zoom-video-chats-are-so-exhausting

11 https://jamanetwork.com/journals/jamaophthalmology/fullarticle/2774808

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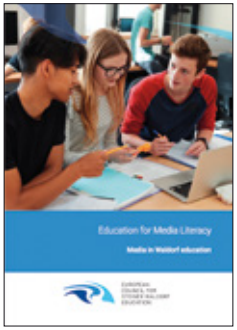


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Basic outline of the educational concept Media in Waldorf education
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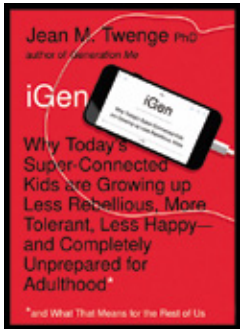


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