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Theory and Practice of *Visual Thinking Strategies* in Upper Secondary Education

ABSTRACT: Visual representations are omnipresent in modern media and cultural life. In our globalized world, they represent important sources of information and, at the same time, powerful tools for manipulation. Images shape our perception, our views and our insights.
Visual Thinking Strategies (*VTS*) is a didactic-methodological concept that promotes the visual, cognitive and social competencies of learners by viewing age-appropriate pieces of art together. The aim of the present study is to investigate the possible effects of *VTS* on 16-year-old students (Upper secondary education in Austria) with specific regard to the development of critical thinking, participatory dynamics and interaction processes. Data from the written pre- and post-tests and videography were quantified and analyzed based on the deductive categorization of *Critical Thinking Skills* and on inductive categorization via open coding. A key finding of this project is that *VTS* has an impact on the critical-argumentative thinking skills of students in Upper secondary education. Moreover, the peer group's discussion, which is led by a *VTS* facilitator, has a positive effect on the participation of "low-performing" and "high-performing" students.

KEYWORDS: *Visual Thinking Strategies,* Abigail Housen, Visual Thinking, *Critical Thinking Skills,* participation, Upper secondary education in Austria

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INTRODUCTION

Visual Thinking Strategies is a visual education concept developed in the 1980s by the psychologist Abigail Housen and Philip Yenawine, Director of Education at the Museum of Modern Art in New York (Yenawine, 2013). The aim of the method is to train the visual-aesthetic awareness of beginners in art reception.

The scientific basis of *Visual Thinking Strategies (VTS)* is Housen's stage theory of aesthetic development (Housen, 1983). Her theory draws on cognitive developmental psychology, constructivism and research on aesthetic development and visual perception. Housen's theory of aesthetic development shows the connection between perception, cognition and aesthetics. In the development of *VTS*, Housen was influenced by the work of James M. Baldwin, Jean Piaget, Lev Vygotskij and Rudolf Arnheim. Baldwin elaborated a three-stage model of cognitive development in children, which he related to aesthetic development. He maintained that accountive viewers respond naively and immediately to aesthetic objects and he considered this immediacy an aspect of aesthetic feedback resonance (Housen, 1983, pp. 170–172). Piaget described the principles of „assimilation", „accommodation", „equilibration" and „diseqilibrium" that run through all stages of life. According to Piaget, „disequlibrium" is an imbalance between what is understood and what is encountered. Learning depends on this process. When „equilibrium" is upset, we have the opportunity to develop (Hoppe-Graff 2014, pp. 168–169). By means of *Visual Thinking Strategies* practice students are brought into „disequilibrium" and thus open to learning processes (DeSantis & Housen, 1996/2000, pp. 3–7). Lev Vygotskij's work illuminates the inseparable relationship between thinking and language. The development of language must be fostered in children so that they learn to think and to understand complex relationships. Targeted instruction in pedagogical contexts should be oriented towards the „zone of the next development" (Flammer, 2008, p. 235). Vygotsky and Piaget noted that a child cannot learn cognitive concepts of a later stage until the previous stage is integrated. Both emphasize the importance of interaction with the environment for intellectual growth for learners. Rudolf Arnheim's relevance to Housen's work lies in his view that visual perception is an act of thinking and thinking can be trained with the help of art objects (Arnheim, 2000, p. 6). A significant finding of Housen's research is that all visually untrained and non-artistic persons, regardless of age and levels of education,

are at the first stage of her „Theory of Aesthetic Development" (Housen, 1983, pp. 140–161). In terms of museum and school educational practice, Housen concluded that the existing approaches to art education do not address the developmental needs of beginner viewers and therefore they do not have a sustainable impact on learners' visual literacy (Housen, 1999, pp. 16–20).

Since the 1970s, the importance of „visual education" for people has been discussed beyond the boundaries of a single discipline. As a result of digitalization, the social significance of images is increasing in both the private and public spheres. Visual representations are an everyday part of the communication and information process. Learners need „image competence" to be able to read images (Doelker, 1997, p. 15). Therefore, educational institutions need adequate didactic settings in which students learn to engage with images in a critical and reflective way (Reißmann, 2015, pp. 6–7; Elkins, 2008, pp. 1–5).

In the Austrian formal education system, visual education is predominantly attributed to art lessons, but it is not anchored as a cross-curricular principle (Köffler, 2020, p. 252). In the pedagogical context, the various school subjects apply different concepts and methods of how images can be used in the classroom to enable learners to deal with pictures in a critical and reflective way (Kanter, 2020, pp. 272–274). The *VTS* method starts from the assumption that „reading pictures" is an elementary cultural technique that needs to be learned – just like reading, arithmetic and writing (Jung & Kraler, 2020, S. 249).

One methodological approach can be seen in *Visual Thinking Strategies*. *VTS* enables students' learning through an intuitive-emotional work with images instead of an intellectual-theoretical approach. *VTS* uses images and developmentally appropriate questions as a starting point to stimulate visual, cognitive and social learning processes in students.

The practical implementation in the classroom follows a clearly structured procedure. The teacher in the role of a facilitator presents an art image to which they ask the three unchangeable *VTS* questions: What's going on in this picture? What do you see that makes you say that? What more can you find? The facilitator paraphrases each answer, while at the same time they point at the respective aspects in the picture („pointing"). They also link the similar or different points of view („linking") and place basic ideas in a broader thematic framework („framing"). Due to the fact that each contribution is paraphrased in an unbiased manner, students are encouraged to participate actively, they learn to justify their opinion and they find out that images can be interpreted in various ways (Jung & Kraler, 2020, pp. 224–249).

AIM OF THIS STUDY, SAMPLING AND METHODOLOGY

This study explores the potential of *VTS* in the field of formal education. The aim of the work was to identify various manifestations of the method *VTS* in a classroom. The research interest focuses on three related aspects: The first aspect examines the question if *VTS* has an impact on the development of *Critical Thinking Skills* (*CTS*)

of students. The reference framework for this aspect of study were four American key studies, the Byron-Study (1993–1998), the San-Antonio-Study (2000–2002), the Gardner-Study (2003–2006) and the Artful-Citizenship-Project (2002–2005). The second aspect was to investigate the possible effects of *VTS* on participatory dynamics, while the third aspect focused on interaction processes.

The participants of this study were students in Upper secondary education in an Austrian private school with public status. Two parallel classes were selected as experimental and control group. All participating students, aged 15 to 16, were from urban middle-class or rural-farming backgrounds. Their socio-economic status was heterogeneous. The students in the experimental and control group had a comparable level of academic achievement, based on the mean school grades. The number of female participants was higher in both the experimental and the control group. The chosen methods of data collection were written tests and videographies (Fig. 1).

Figure 1. Method and number of participants in experimental and control group

Method	Experimental group - Participants		Control group – Participants	
Written Pre- and Post-Test	18 female (75%)	6 male (25%)	19 female (79,16%)	5 male (20,83%)
Videography	19 female (67,85%)	9 male (32,14%)	no	no

The written pre-post-test-design with experimental and control group was used to demonstrate a possible relationship between the application of *VTS* and the development of *CTS.* The transcripts of the video-based *VTS* units formed the basis for the investigation of the interaction processes that became visible through the systematic use of *VTS* in the classroom. The *VTS* interventions were spread over one school year. In each of the ten 50-minute- sessions, two pictures were worked with, using the *VTS* method. The data material was evaluated by two persons in teamwork using a coding manual. Data from the written pre- and post-tests and the transcripted videographies were quantified and analyzed descriptively-statistically with SPSS and MAXQDA.

RESEARCH QUESTIONS AND FINDINGS

In line with the objective of the study, the following four main questions and goals are discussed.

- Question 1: To what extent does working with *Visual Thinking Strategies (VTS)* in a classroom setting impact the development of *Critical Thinking Skills (CTS)?*
- Question 2: Which participatory dynamics are revealed by the application of *Visual Thinking Strategies* in a classroom setting?

» Question 3: Which changes in the use of *Critical Thinking Skills* (*CTS*) are revealed by the application of *Visual Thinking Strategies* in a classroom setting?
» Question 4: Which phenomena can be identified with the help of a qualitative-reconstructive approach to the data material?

The individual questions are discussed below.

Question 1: To what extent does working with *Visual Thinking Strategies (VTS)* in a classroom setting impact the development of *Critical Thinking Skills (CTS)?*

To answer the first research question written pre-tests and post-tests were administered in the experimental (EX) and control (KO) groups at the beginning and the end of school year 2017/2018. While the students in the experimental group participated in *VTS*, the students in the control group did not.

The three specific *VTS* questions allowed the students to express individual views and to select content in a self-determined way in the written pre- and post-test (Housen, 1983, pp. 48–51). The visual art objects[1] (Fig. 2 and Fig. 3) of the written tests were selected according to the age of the participants[2].

Figure 2. Picture „pre-test"[3]

1 I decided to use two different pictures to keep the interest of the students.

2 The theme of the artwork should be chosen for students so that they can discover both familiar and new things.

3 Cathal McNaughton (2013). *A farmer in County Antrim, Northern Ireland, searched for his sheep after a heavy snowfall over the weekend.* Retrieved February 22, 2019, from: https://learning.blogs.nytimes.com/2013/04/08/whats-going-on-in-this-picture-april-8-2013

Figure 3. Picture „post-test“[4]

Data from the written tests were analysed through qualitative content analysis (Kuckartz, 2016, p. 120) using deductive category application of *CTS*. The data were coded according to four categories of *CTS*: „Observation“ (BEOB), „Speculation“ (VERM), „Supported Observation“ (BEGR) and „Multiple Possibilities“ (ALTS).

Figure 4 compares the post-test results of the experimental and control group in terms of the categories of *CTS*. In the category „Observation“ (POST_BEOB) there is no significant difference between the mean scores of the control group (M=16.83, SD=10.51, n=24) and the experimental group (M=16.40, SD=13.77, n=25). Neither has the experimental group in the category „Multiple Possibilities“ (POST_ALTS) (M=0.92, SD=1.32, n=25) significantly higher mean scores than the control group (M=0.5, SD=0.72, n=24). Differences exist in the categories „Supported Observation“ (POST_BEGR). The experimental group shows a significantly higher mean value (M=3.32, SD=2.036, n=25) in the category „Supported Observation“ (POST_BEGR) than the control group (M=0.71, SD=1.268, n=24). Another difference between the control group and the experimental group becomes obvious in the category „Speculation“ (POST_VERM). The experimental group shows higher mean scores (M=7.16, SD=2.925, n=25) than the control group (M=4.42, SD=3.335, n=24).

4 Niels Ackermann (2016). *Coming of Age in the Shadow of Chernobyl.* Retrieved September, 2018, from: https://www.nytimes.com/2016/09/26/learning/whats-going-on-in-this-picture-sept-26-2016

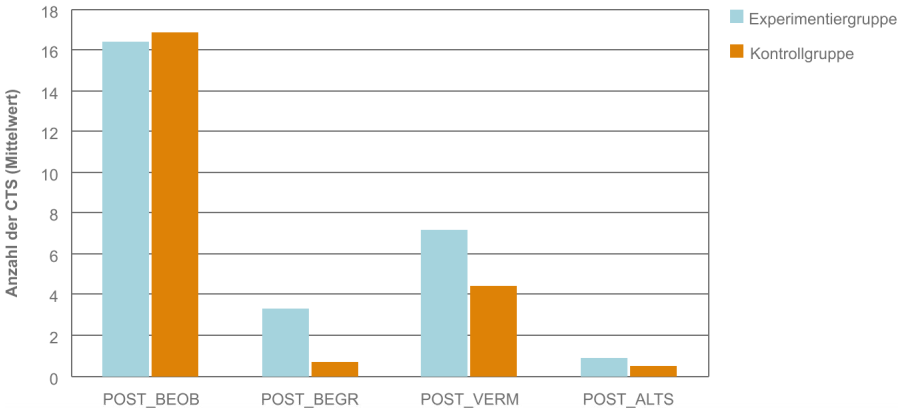

Figure 4. Number of CTS in the four categories of KO and EX in the post-test

In the next step the category „Supported Observation" was investigated more deeply. The goal was to consider the quality of the evidence in the students' opinions. A distinction was made between whether the evidence is based on observation in the image (strong evidence = BEGR_STARK) or whether the statement is based on speculation (weak evidence = BEGR_SCHWACH).

The pre-tests (Fig. 5) show that the experimental group starts from a higher level in both categories. The number of weak evidences (BEGR_SCHWACH) in the pre-tests in the experimental group is 14, in the control group 2. The number of strong evidences (BEGR_STARK) in the experimental group is 28, in the control group 14.

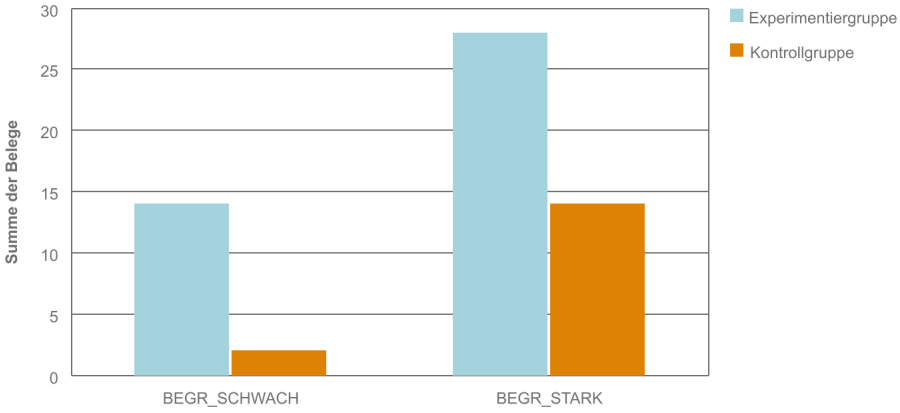

Figure 5. Comparison of the sums of BEGR_WEAK and BEGR_STARK in the KO and EX in the pre-test

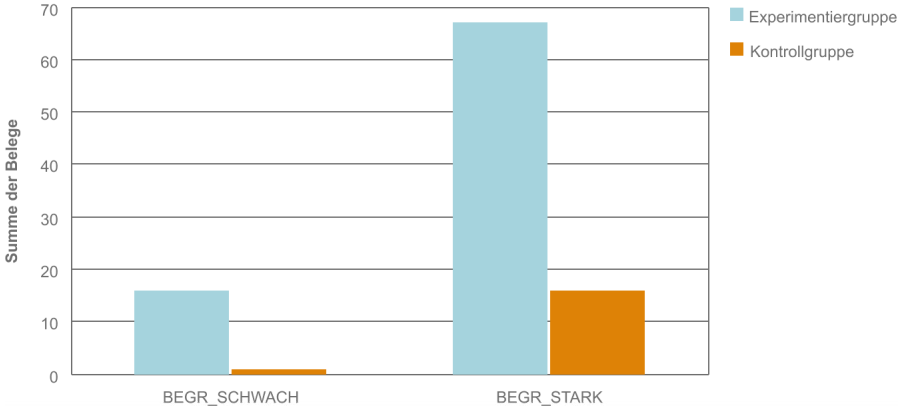

Figure 6. Comparison of the sums of BEGR_WEAK and BEGR_STARK in the KO and EX in the post-test

In the post-tests (Fig. 6) the number of weak evidences (POST_BEGR_SCHWACH) in the experimental group is 16 whereas in the control group it is 1. The number of strong evidences (POST_BEGR_STARK) in the experimental group is 67, in the control group 16. The difference in development between the two groups may indicate the effectiveness of *VTS* in the intervention group.

Question 2: Which participatory dynamics are revealed by the application of *Visual Thinking Strategies (VTS)* in a classroom setting?

The question of participatory dynamics emerged from field reports by US teachers providing insightful evidence on the impact of *VTS* on individual and group change processes (Yenawine, 2013, pp. 33–38).

Figure 7 shows the number of actively participating students over the course of the ten VTS units. 12 to 18 of the 28 students actively participated in each lesson. This corresponds to an average participation of 54.6%.

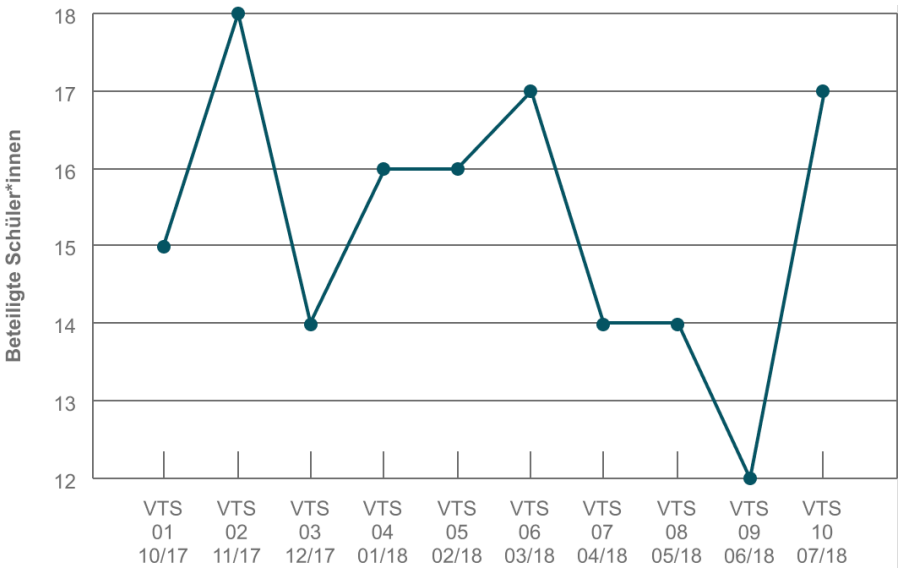

Figure 7. Participating students per VTS unit

This study specifically examines whether high-performing students participate significantly more often in the *VTS* setting than low-performing students. In order to examine participation, the students were divided according to their academic performance into a „high performance" group with a grade point average of 1 to 1.50 (six students) and a „low performance" group with a grade point average of 2.51 to 3.50 (seven students). The development of participation in the „high performance" and „low performance" groups was examined across all ten *VTS* units. For this purpose *VTS* units 1 to 3, 4 to 7, and 8 to 10 were combined.

Figure 8 shows the participation of these students over the *VTS* intervention period. In both groups participation tends to increase over time, but in different ways. The „high performance" group enters at a higher level than the „low performance" group. It is not until the fourth *VTS* unit that this group's participation increases steadily. The increase in participation in the „low performance" group manifests itself clearly between the first and fourth unit and then remains at approximately the same level.

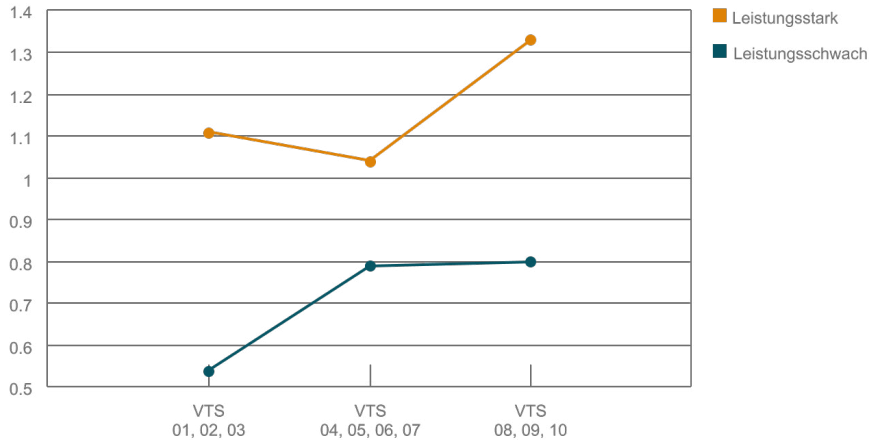

Figure 8. Mean scores of the participation of the „high performance" and „low performance" group over the VTS period.

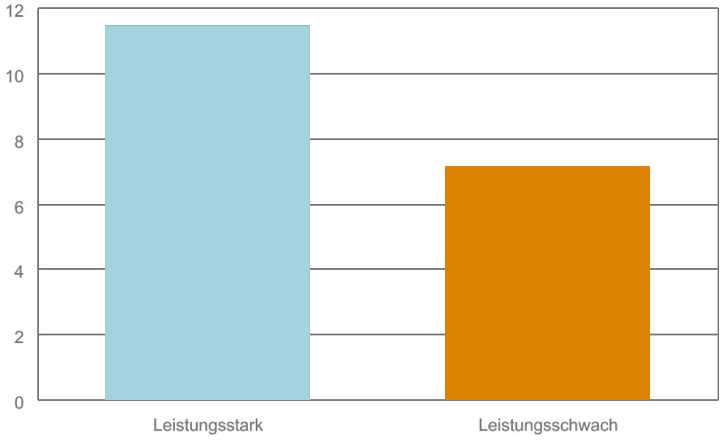

Figure 9. Mean scores of the participation of the „high performance" and „low performance" group and „low performance" group

Figure 9 shows a trend that was already apparent in terms of participation over the course of the VTS units: The „high performance" group consistently participated more frequently in the *VTS* discussions than the „low performance" group. But the difference is not as significant as originally assumed.

Question 3: Which changes in the use of *Critical Thinking Skills* (*CTS*) are revealed by the application of *Visual Thinking Strategies (VTS)* in a classroom setting*?*

The data from the transcribed videographies of the first, fifth, and tenth *VTS* units formed the basis for answering this question. The videographies were analyzed using Kuckartz's (2016, p. 120) qualitative content analysis to examine the following deductive application of *CTS* categories: „Speculation" (VERM), „Observation" (BEOB), „Supported Observation Strong" (BEGR_STARK), „Supported Observation Weak" (BEGR_SCHWACH) and „Multiple Possibilities" (ALTS). Data were analyzed with MAXQDA (Rädiker & Kuckartz, 2019). The results were translated into numbers. Figure 10 shows the categories of *CTS* in the assigned colour codes according to frequency of occurrence.

Figure 10. Categories of Critical Thinking Skills with number of codes

Critical Thinking Skills	**Number of Codes**
„Speculation" (VERM)	376
„Observation" (BEOB)	215
„Supported Observation Strong" (BEGR_STARK)	49
„Supported Observation Weak" (BEGR_SCHWACH)	40
„Multiple Possibilities" (ALTS).	18

MAXQDA is a software for qualitative and mixed methods data analysis. It offers the possibility to visualize the sequence of the different coding categories and the number of coded segments in the documents and to display them in the form of „document portraits" by sorting the five categories of *CTS* by colour codes and placing them next to each other in column form. In MAXQDA the size of the columns is calculated in not only according to the number of codes in each category, but also according to their length in the document. The result is implemented graphically in form of dots in the document portraits (Rädiker & Kuckartz, 2019, pp. 174–176).

A comparison of the document portraits from the first, fifth and tenth *VTS* units shows that in the tenth VTS unit in particular the number of circles increased in the categories „Supported observation_Strong" (colour code red), „Supported observation_Weak" (colour code pink) and „Multiple Possibilities" (colour code green) (Fig. 11).

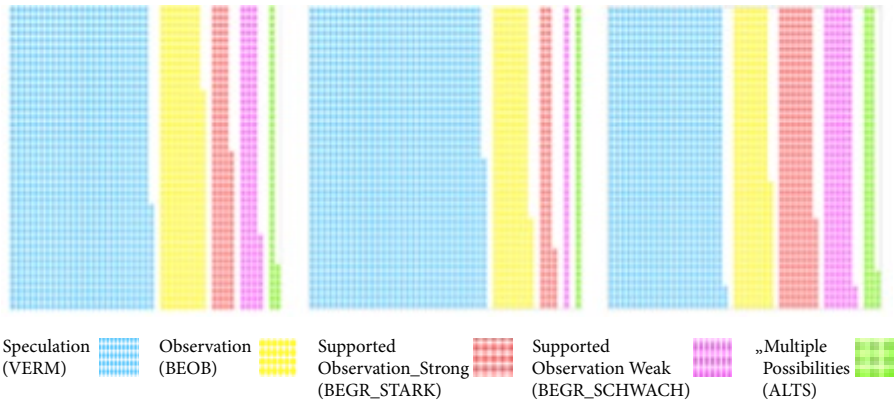

Figure 11. Document portraits from the first images of VTS-unit 1-5-10

It is striking that the number of codings in the first image of the tenth *VTS* unit is significantly higher in the category „Observation" (color code yellow) with 37 than in the categories „Supported observation_Strong" with 18 and „Supported observation_Weak" with 9 (Fig. 12). In the document portraits, however, the numbers of dots in these categories do not show this obvious difference. The reason is that MAXQDA counts both the number of codings and the number of words used in each coding. This evidence indicates that students increasingly learn to verify their thoughts argumentatively because of *VTS* and thus train their oral expression skills.

Figure 12. Number of codings and number of dots in the portraits of the 1st, 5th and 10 VTS units

		Speculation		Observation		Supported Observation_ STRONG		Supported Observation_ WEAK		Multiple Possibilities	
		number	dots	number	dots	number	dots	number	dots	number	dots
unit 1	picture 1	86	970	66	309	11	141	13	134	4	46
	picture 2	67	1211	19	193	3	52	5	121	2	23
unit 5	picture 1	71	1180	36	252	6	88	2	40	4	40
	picture 2	50	1076	25	214	7	211	2	50	2	49
unit 10	picture 1	67	803	37	257	18	252	9	203	5	85
	picture 2	29	794	33	363	4	127	9	290	4	26

If the number of codings in the categories „Supported observation_Strong" and „Supported observation_Weak" is not differentiated, but summed up under the category" Supported observation" (BEGR), the 27 codings correspond to 455 circles. This

would rank this category ahead of the category „Observation" in the document portrait. This finding could be another indication of the effectiveness of the *VTS*- method in terms of helping to increase students ability to give argumentative reasons for their opinions. These findings support Yenawine's (2013, p. 107) assumption that *VTS* promotes the development of language in students. This is in line with Vygotskij claim that language is a pre-requisite for the development of cognitive abilities, because speaking and thinking are inseparable (Flammer, 2008, pp. 234–245).

Question 4: Which phenomena can be identified with the help of a qualitative-reconstructive approach to the data material?

The data from the transcribed videographies of the first, fifth, and tenth units are the basis for using open coding to identify new phenomena that provide clues to personal and group dynamic processes in *VTS*. The analysis of the written transcripts and their systematization was done with MAXQDA (Rädiker & Kuckartz, 2019). SPSS, the statistical software for the social sciences, was used for the analysis of the quantified data. Figure 13 shows the identified inductively formed categories. It turned out that the category „Verbalizing ways of thinking" was reconstructed most frequently with 43 characteristic expressions. The category „Linking" with its two sub-categories was coded a total of 24 times. The category „Insights" with three sub-categories was counted less frequently with 20 codings. The categories „Discourse on method" and „Correction of teacher's paraphrase" were coded 10 and 8 times, respectively.

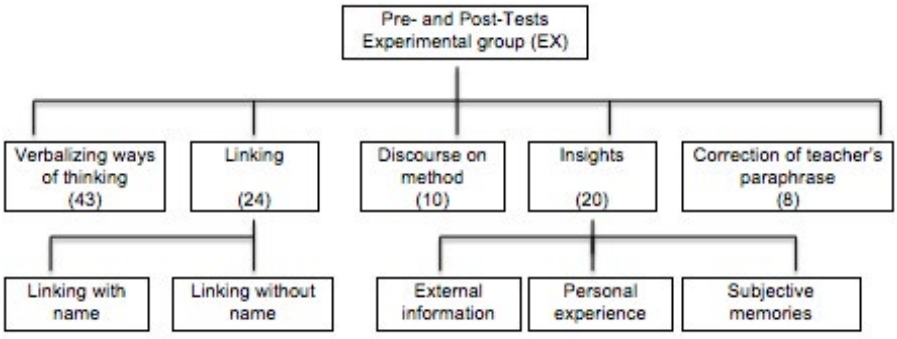

Figure 13. Overview of inductively formed categories

Out of the five categories identified, I would like to highlight two: „Verbalizing ways of thinking" and „Linking". Students used the category „Verbalizing ways of thinking" most frequently, mainly from the fifth *VTS* unit onwards. This category contains codings that allow insight into the speaker's world of thoughts. These are, for example, loudly formulated reflections, conclusions, uncertainties, self-reflections or judgements. Figure 14 shows the change over time in the form of a progres-

sion diagram: The number of codings increases from 6 in the first *VTS* unit to 19 in the fifth *VTS* unit and decreases to 18 codes in the tenth *VTS* unit.

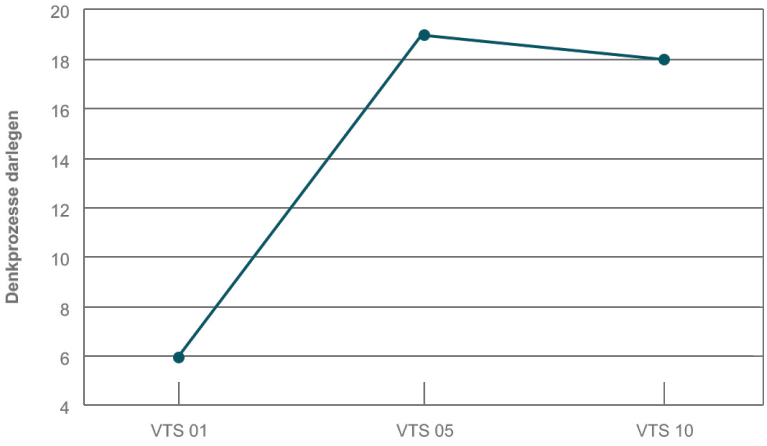

Figure 14. Progress diagram „Verbalizing ways of thinking"

In order to reveal personal insight, students need an atmosphere that is free of fear and conducive to growth. The finding of the study may be an indication that students develop self-confidence, open up, and provide personal insight over the course of subsequent *VTS* units. This category also provides indication that in the *VTS* setting the confrontation with artworks triggers irritations in students. Individual cognitive change requires developmentally appropriate stimuli that bring students into the imbalance of „disequilibrium" and thus make them open to learning processes, according to Housen. In the *VTS* units new views were discussed in the social community of the peer group. Housens states that this ist the starting point for changed ways of looking at thinking and eliminating the „disequilibrium" (DeSantis & Housen, 1996/2000, pp. 3–7).

The category „Linking" with the two sub-categories „Linking with name" and „Linking without name" is characterized by students relating their own thoughts to those of their peers during *VTS* discussions. The students refer to similar, same or contrasting ideas voiced by their colleagues, with or without mentioning the specific names.

Signs of change are evident in the students' language behaviour. The progress diagrams of „Linking with name" (Fig. 15) and „Linking without name" (Fig. 16) show an increase in coding over the course of the *VTS* units.

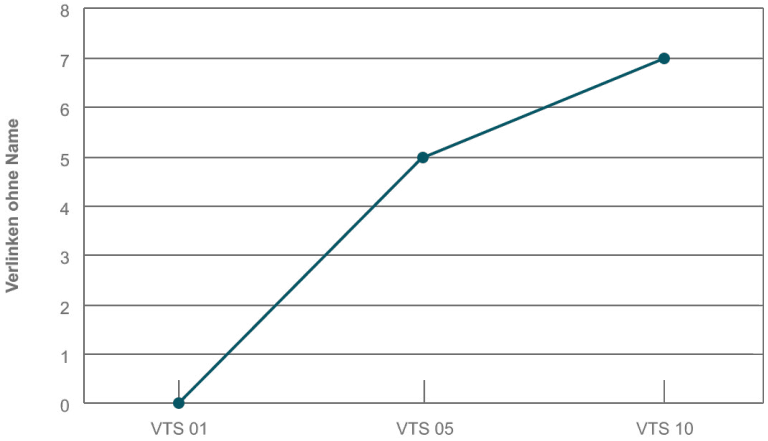

Figure 15. Progress diagram „Linking without name“

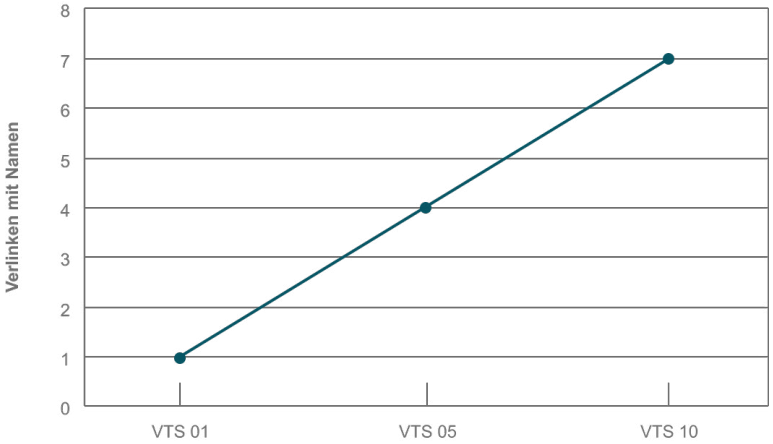

Figure 16. Progress diagram „Linking with name“

In the sub-category „Linking with name“, the number of codes increases from 1 to 4 and 7 codes from the first to the fifth and tenth *VTS* units, respectively, and from 0 to 5 and 7 in the „Linking without name“ sub-category. From the fifth *VTS* unit onwards, students begin to link their thoughts to the thoughts of fellow students. By using the technique of „Linking“ they demonstrate that they are also attentive listeners. Listening is an important component of successful communication, and this finding provides evidence that *VTS* trains this aspect of social competence.

CONCLUSION

The present study shows that *VTS* is a **didactically complex concept** (Fig. 17).

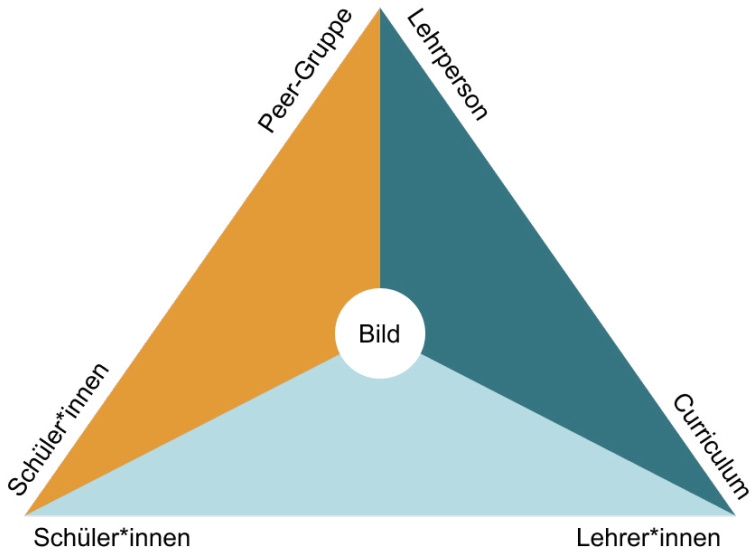

Figure 17. Didactic concept of VTS

The first didactic triangle, shaded in light blue, represents the interaction processes between the students, the teacher and the learning object „image". Pictures are selected by the teacher according to age and developmental aspects and are the starting point for the development of visual competencies. The second didactic triangle, shaded in orange, shows the group-specific interaction processes of *VTS*. In the social setting of the peer group, the exchange of subjective visual experiences promotes communicative processes and cooperative-discovery learning among the students. The learning object „image" is particularly suitable for triggering irritating visual stimuli in students. The third didactic triangle shaded in dark blue, places *VTS* in the context of formal education.

One finding of this study is that that **changes in critical-argumentative thinking** could be identified among students in Upper secondary education (Sekundarstufe II) after ten *VTS* units. For Paul & Elder (2003, p. 1) the characteristics of trained critical thinking are, in addition to actively asking questions and collecting information, interpreting and drawing conclusions, being open to alternative points of view, and the ability to communicate. An effect of *VTS* can be identified in the finding that students of the experimental group show a significantly more frequent use of the *CTS* categories „Supported Observation" and „Speculation" in the written post-tests than

the control group. It can be assumed that after one year of VTS intervention students already learned to reason comprehensibly and that they have applied what they have learned in the individual setting of the written post-tests. However, further empirical research is needed to generalize the relationship between the development of *CTS* and the factors „time of the intervention" and „age of the students".

Another finding is that an average of 54.60% students showed **active participation** in the *VTS* units. It can be assumed that the *VTS* setting motivates learners to actively participate in the lessons. The discussion in the peer group, in which the teacher moderates the discussion of images neutrally, supports a constructive approach to different content positions. This promotes social skills such as the ability to listen, to observe rules of conversation, and to deal with the opinions and arguments of others without prejudice. These skills are important for successful communication. Reflective interaction and sharing of knowledge and observations are indicators of every *VTS* process. The active participation of more than 50% of the students in the *VTS* units suggests that the discourse-oriented *VTS* setting can be seen as a component for the democratic participation of the students in the classroom (Lange & Himmelmann, 2007, p. 22; Edelstein & Frank, 2009, pp. 10–11).

This study also provides evidence that *VTS* has the **potential to support participation of low-performance students**. In the post-test, the low-performance students of the experimental group showed significantly higher scores in the categories „Supported Observation" and „Speculation" compared to their pre-tests. The didactic setting of *VTS*, in which looking at art together and sharing experiences in the peer group are essential, may have had a positive effect on the low-performance students. Regarding participation in the *VTS* units, it was found that „high-performance" students spoke more frequently in all *VTS* units from the beginning, but there was no significant difference between the participation of high-performance and low-performance students. Therefore *VTS* can be considered an instrument that motivates even low-performance students in Upper secondary school to participate. But *VTS* cannot compensate for the fallings in performance that have arisen in the course of schooling.

Another finding of the present study suggests that the **teacher's language behaviour has an impact on the students' language behaviour**. It was found that a technique of facilitation, namely „linking", increasingly appeared in the students' contributions. From the fifth *VTS* unit onwards, they begin to link their thoughts to the thoughts of fellow students. For the verbal interaction between teacher and students in *VTS*, the teacher's quality of paraphrasing the comments of students is of central importance and represents a special challenge in the work with high school students. To „translate" what is heard and to put it into a larger context requires a high level of attention and language competence on the part of the facilitator. In the *VTS* units, active listening is thus trained on both the teaching and learning sides. Referring to the communication model of person-centered conversation by Carl Rogers, the three behavioral characteristics for counseling and therapy, namely empathy, emotional

appreciation and congruence also apply to the social setting of *VTS*. Person-centered relationships enable sustainable development processes (Rogers, 1985, pp. 36–38).

The method *Visual Thinking Strategies* enables students to be creative and critical by offering spaces to think and speak freely. Visual-aesthetic education is of increasing relevance in our modern digitalized world.

REFERENCES

Arnheim, R. (2000). *Kunst und Sehen. Eine Psychologie des schöpferischen Auges*. De Gruyter.

DeSantis, K., & Housen, A. (1996–2000). *A Brief Guide to Developmental Theory and Aesthetic Development*. Retrieved August 10, 2019, from: https://pdfs.semanticscholar.org/5f00/13b70198248314466f5bcdf8627b2978730a.pdf

Doelker, C. (1997). *Ein Bild ist mehr als ein Bild. Visuelle Kompetenz in der Multimedia-Gesellschaft*. Klett-Cotta.

Edelstein, W., & Frank, S. (Hrsg.).(2009). *Praxisbuch Demokratiepädagogik. Sechs Bausteine für Unterrichtsgestaltung und Schulalltag*. Beltz.

Elkins, J. (2008). Introduction: The Concept of Visual Literacy, and Its Limitations. In J. Elkins (Ed.), *Visual Literacy* (pp. 1–9). Taylor & Francis Group

Flammer, A. (2008). *Entwicklungstheorien. Psychologische Theorien der menschlichen Entwicklung*. Verlag Hans Huber.

Hoppe-Graff, S. (2014). Denkentwicklung aus dem Blickwinkel des strukturgenetischen Konstruktivismus. In L. Ahnert (Hrsg.), *Theorien in der Entwicklungspsychologie* (pp. 148–173). Springer.

Housen, A. (1983). *The Eye of the Beholder: Measuring Aesthetic Development*. Harvard Graduate School of Education.

Housen, A. (1999). *The Eye of the Beholder: Research, Theory and Practice*. Retrieved April 5, 2020, from: https://VTShome.org/wp-content/uploads/2016/08/5Eye-of-the-Beholder.pdf

Housen, A. (2001–2002). *Aesthetic Thought, Critical Thinking and Transfer*. Retrieved March 24, 2021, from: https://VTShome.org/wp-content/uploads/2016/08/5Eye-of-the-Beholder.pdf

Jung, A., & Kraler, C. (2020). Bilder lesen als elementare Kulturtechnik. *Erziehung und Unterricht,* (3–4), 241–250.

Kantner, H. (2020). „Politische Bilder" bewusst einsetzen. Anregungen für den Einsatz von visuellen Materialien im Unterricht zur Schulung eines kritisch-reflexiven Sehens und Bildhandelns. *Erziehung und Unterricht,* (3–4), 270–280.

Köffler, N. (2020). Was Fotografie zur visuellen Bildung beitragen kann und was wir von ihr lernen können. *Erziehung und Unterricht*, (3–4), 251–260.

Kuckartz, U. (2016). *Qualitative Inhaltsanalyse. Methoden, Praxis, Computerunter-Stützung* (2. Aufl.). Beltz Juventa.

Lange, D., & Himmelmann, G. (Hrsg.).(2007). *Demokratie-Bewusstsein. Interdisziplinäre Annäherung an ein zentrales Thema der Politischen Bildung*. Springer VS.

Paul, R., & Elder, L. (2003). *Kritisches Denken. Begriffe & Instrumente. Ein Leitfaden im Taschenformat.* Retrieved November 5, 2020, from: https://www.criticalthinking.org/files/german_concepts_tools.pdf

Rädiker, S., & Kuckartz, U. (2019). *Analyse qualitativer Daten mit MAXQDA. Text, Audio und Video*. Springer VS.

Reißmann, W. (2015). *Mediatisierung visuell: Kommunikationstheoretische Überlegungen und eine Studie zum Wandel privater Bildpraxis*. Nomos.

Rogers, C. (1985). *Die nicht-direktive Beratung* (6. Aufl.). Fischer.

Yenawine, P. (2013). *Visual Thinking Strategies. Using art to deepen learning across school discipines*. Harvard Education Press.

TEORIA I PRAKTYKA STRATEGII MYŚLENIA WIZUALNEGO W SZKOLNICTWIE PONADGIMNAZJALNYM

ABSTRAKT: Reprezentacje wizualne są wszechobecne we współczesnych mediach i życiu kulturalnym. W naszym zglobalizowanym świecie stanowią one ważne źródło informacji, a zarazem potężne narzędzie manipulacji. Obrazy kształtują naszą percepcję, nasze poglądy i spostrzeżenia. Strategie myślenia wizualnego (Visual Thinking Strategies, VTS) to koncepcja dydaktyczno-metodyczna, która promuje wizualne, poznawcze i społeczne kompetencje uczniów poprzez wspólne oglądanie dzieł sztuki dostosowanych do wieku. Celem badań własnych jest określenie możliwych skutków stosowania VTS w pracy edukacyjnej z 16-letnimi uczniami szkoły ponadgimnazjalnej (szkoła ponadgimnazjalna w Austrii) ze szczególnym uwzględnieniem odniesienia do rozwoju krytycznego myślenia, dynamiki uczestnictwa i procesów interakcji. Dane z pisemnych testów wstępnych i końcowych oraz nagrań wideo zostały przeanalizowane ilościowo w oparciu o kategoryzację dedukcyjną umiejętności krytycznego myślenia oraz kategoryzację indukcyjną z zastosowaniem kodowania otwartego. Kluczowym wnioskiem z tego projektu jest to, że VTS ma wpływ na umiejętności krytycznego myślenia uczniów szkół ponadgimnazjalnych. Co więcej, dyskusja w grupie rówieśniczej, która jest prowadzona przez facylitatora VTS, ma pozytywny wpływ na biorących w niej udział uczniów o „słabych" i „wysokich" wynikach.

SŁOWA KLUCZOWE: strategie myślenia wizualnego, Abigail Housen, myślenie wizualne, umiejętność krytycznego myślenia, uczestnictwo, szkolnictwo ponadgimnazjalne w Austrii