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Under the magnifying glass: critical moments in virtual exchange

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Abstract

Virtual Exchange (VE) is a form of experiential learning that relies heavily on learning-by-doing and reflection. The present study draws on visual data comprising students' perceptions of critical learning incidents presented under an imaginary magnifying glass. To complete this project-closing reflective activity, the students had to describe a critical moment that they had experienced during VE and present it in a visual form. Data was collected longitudinally, in three projects (2019, 2020, and 2021) that followed the same pedagogical design and focused on the theme of tourism. The collaborating universities were from three countries: Poland, Finland, and the Netherlands. We used the methods of qualitative content analysis and social semiotic analysis to investigate the students' reflections. The findings show that the most frequently expressed themes were related to participation in the first meeting, joint production, use of a foreign language, and adaptation to change. The study contributes to a better understanding of the role of multimodal reflection in VE.

Keywords: virtual exchange; critical learning incidents; multimodal reflections.

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1. Introduction

Critical learning incidents are perceived as effective, exceptional, and personally meaningful learning situations, which may offer an opportunity for learning and personal growth (Soini, 2012, p. 846). Such learning situations can either feel rewarding, or on the contrary, frustrating and even distressing for the learner (Brookfield, 1990). Reflection tasks can raise awareness of the critical learning moments and highlight their importance. In the present study, we analyse the students' visual reflections to explore the critical moments that they experienced in VE.

We see VE as a form of experiential learning, at the core of which is learning-by-doing and reflection. Our study focuses on three interdisciplinary projects, which took place in 2019, 2020, and 2021. The pedagogical design followed the transnational model of VE⁴ (O'Dowd, 2021) because it centered around the global theme of tourism and required students to solve tasks together, instead of engaging them in simple intercultural comparison. In 2019, the project was run between a Polish and a Finnish university. In 2020 and 2021, a third university joined from the Netherlands. The students represented three main disciplines: tourism (Poland), business (Netherlands), and linguistics (Finland).

The international teams solved various tasks such as comparing and analyzing their own cities' tourism websites, exchanging ideas on tourism trends and target groups, and developing promotional material about the three cities. At the closure of each VE, one of the final assignments was a visual reflection task adapted from Kurek and Müller-Hartmann (2018). Each student was asked to draw a magnifying glass that highlighted a critical moment that they had experienced during the VE. The reflections were collected for data analysis with the participants' informed consent. In total, 97 students participated in the three exchanges, and 76 magnifying glasses were examined. In the first stage of the analysis, we applied content analysis to identify the themes reported as critical moments in all the magnifying glasses. In the second analytical stage, we chose two examples for each of the main themes (in total eight examples) and analyzed them with the method of social semiotic analysis.

Several studies have discussed students' reflections on VE projects, taking a broader scope and drawing mostly on questionnaires, interviews, or learning diaries as data. In current VE studies, there has been an emphasis on the challenges experienced by participants and, to our knowledge, no research has been done on multimodal reflections regarding critical learning incidents. The present study fills the gap by focusing on the visual expression of what the students considered

4. The transnational model of virtual exchange "is characterized by tasks which focus on global themes and issues, and which require students to work together to solve a problem or complete a task together, rather than focusing explicitly on differences in cultural practices or perspectives" (O'Dowd, 2021, p. 3).

critical learning incidents. The magnifying glasses drawn by the students can be interpreted as multimodal ensembles or multimodal texts (Kress, 2010) that realize meaning making via the use of both linguistic and visual resources. Our research questions were as follows: (1) What themes did the students present as critical VE moments in the magnifying glass activity? (2) What semiotic resources did the students use to create meaning in their visual reflections?

2. Critical learning incidents

Soini (2012) defined critical learning incidents as situations “which learners have experienced as effective, exceptional, or personally meaningful ... [and which] may lead to educationally significant learning and personal growth” (p. 846). Thus, a critical learning incident can be understood as something that the students feel special about, an important moment that they experienced. In addition, critical learning incidents have the potential to become turning points and may lead to transformative learning. As Woods (1993) suggested, a critical incident or learning moment is not necessarily a challenging or frustrating experience. These moments may just as well be personally uplifting and positive situations (Woods, 1993). Very often, these situations evoke a mix of feelings, starting with negative expectations that transform into a sense of disorientation to finally bring about relief and satisfaction.

McAllister et al. (2006) suggested that critical incidents were open to multiple interpretations and therefore served as useful resources for exploring the development of critical thinking. In the present study, we understand critical learning incidents as critical and meaningful moments in learning, which may lead to significant realizations and insights. In our instructions for the magnifying glass activity, we asked the students to express a critical moment, which ‘can be either a good or a bad experience, a memorable moment that you experienced in the project’. This approach is in line with Soini’s (2012) definition in the sense that it is based on the conceptualization of a critical learning incident as an ‘effective, exceptional, or personally meaningful’ event. In our understanding, such moments do not necessarily function as transformative points for learning, but they carry this potential. In this paper, we are going to use the terms ‘critical learning incidents’ and ‘critical moments’ interchangeably, emphasizing their importance and salience as experienced by the students.

Critical learning incidents offer opportunities for the students to become more aware of their learning and for the teachers to develop their teaching. Brookfield (1990) encouraged teachers to ask their students to report on their critical learning incidents, for example, through written reports, learning journals or questionnaires. He developed the method of the critical incident questionnaire: a list

of questions that make the students focus on specific learning events that they have perceived as most exciting and rewarding or as most distressing and disappointing. Brookfield (1990) pointed out the importance of such critical incident exercises both for the students and the teacher. Identifying critical moments can raise students' awareness of their own learning processes and help the teacher to improve their teaching.

3. Reflections

Reflections are central to experiential learning. Beard and Wilson (2004) defined experiential learning as “the insight gained through the conscious or unconscious internalization of our own or observed interactions, which build upon our past experiences and knowledge” (p. 16). Dewey's (1938/2015) pragmatic approach to experience emphasized its practical and empirical aspects, suggesting that one can learn about the world only using one's experience and through reflections. This is clear from the dynamic view of learning, which is based on a learning cycle driven by the resolution of the dual dialectics of *action/reflection* and *experience/abstraction* and independent learning styles in a constructed learning space.

Kolb (2015) viewed the role of reflection as transformative and central to experiential learning. Reflection is “the internal transformation of experience” (Kolb, 2015, p. 58), which is often initiated by the shock of a direct concrete experience. Reflection is thus an important stage in the learning cycle. Not all experiences are genuinely or equally educational. If, for example, the experiences are disconnected from one another, or they are superficial, they do not necessarily lead to learning (Dewey, 1938/2015). It is what people ‘do with the experience’ that constitutes learning (James & Brookfield, 2014).

Reflections can help us to develop a deeper awareness of the experiences and convert their complexities into knowledge or understanding (James & Brookfield, 2014). As Humphrey (2009) pointed out, reflection is “the activity which takes place in our own minds when we stand back from the first-order phenomena in everyday life and process these raw experiences from a distance, inviting second-order processes to come into play” (p. 381). Reflection thus needs time and space – they both give distance and perspective. The dust must settle first. Then the reflective stage should follow for the learning to happen.

However, it is important to point out the difference between reflections and self-reflections. When reflections are shared with the teacher and other participants, the awareness of the audience may have an impact on the formulation of the reflection. Brookfield (2005) calls attention to this when

discussing students' learning journals as instruments of surveillance. Knowing that the teacher is going to read their reflections, the students might express their thoughts in adjustment to the teacher's expectations. The awareness of external readers can have a normalizing effect on the formulation of thoughts (Brookfield, 2005).

4. Multimodality

The present study draws on data collected in a project-closing activity, namely the drawing of a magnifying glass reflecting a critical moment in its focus. The students' works can be interpreted as multimodal texts or as cohesive multimodal ensembles (Kress, 2010, 2011; Serafini, 2014, p. 12), which are composed of disparate elements. As proposed by Kress and van Leeuwen (2001), multimodality can be understood as the operation of semiotic principles through various modes and semiotic resources. Language is only one of the modal resources for meaning making (Kress, 2011, p. 38; Kress & van Leeuwen, 2001). Meaning is constructed as a complex interplay of various modes, with each mode carrying a particular functional weight or load in the meaning creation (Jewitt & Henriksen, 2016). Examples of modes can be image, writing, layout, music, gesture, animation, soundtrack, and 3D objects (Kress, 2010, p. 79).

Kress (2010) further points out that modes have a socially shaped and culturally determined nature. Different modes integrate different potentials or affordances (see Jewitt & Henriksen, 2016) for meaning making, which can influence the mode choice(s). Considering writing as a mode, for example, the potentials or affordances involve the various means of its realization through semiotic resources, such as words, sentences, or even font type and the use of spacing (Kress, 2010). Machin and Mayr (2012, p. 9) also call attention to the communicative choices that authors make across modes through text creation and add that although the choices seem to be neutral, they are ideological representations of events and persons.

Multimodality, especially visualization, offers a great potential for collecting and studying reflections and subjective experiences. A visual expression of one's experiences provides an alternative or supplementary way to verbal reflection because it can help to make sense of the complexity of learning trajectories and offer opportunities to express what is difficult to put into words (Kalaja & Pitkänen-Huhta, 2018). Although the use of visual reflections is becoming more common in higher education, Bezemer and Kress (2016, p. 96) stated that most course assessments and reflection tasks were expected to be done mainly in writing. Deviating from this routine, Williamson (2009) used collages to generate student reflections. Williamson (2009) believes that such non-text-based tools of reflection allow for an alternative and creative expression of complex ideas and feelings. The

liberating experience of visual expression was confirmed by Kernan, Basch, and Cadoret (2018), who used mind mapping to help undergraduate students to brainstorm topic ideas for research.

5. Challenges in VE

Research on students' experiences and perceptions of VE has mainly focused on challenges but has not explored specifically critical learning incidents. O'Dowd and Ritter (2006) analyzed various data samples, including written feedback and interviews, to explore the factors behind failed communication in telecollaboration. They pointed out, for example, the role of insufficient intercultural competence, low motivation, unreasonable expectations, or the use of technology as factors that could generate critical situations. Fondo and Jacobetty (2020) studied affective barriers, in particular foreign language anxiety, during VE. They found two main aspects responsible for the development of anxiety: (1) linguistic and learning related reasons; and (2) interaction via technology. Using discourse analysis, Háhn (2021) explored students' perceptions by studying their emotions as expressed in their VE e-portfolios, focusing on the main stages of the virtual exchange journey. Although many students reported negative feelings (e.g. anxiety, frustration), especially at the start of the project, most of them framed VE as a path of personal development, involving a move from initially negative emotions to positive ones and expressing growth in the students' self-confidence.

The EVALUATE Group (2019) examined the impact of VE on initial teacher education in the framework of a large-scale study, including 25 projects arranged at 34 teacher training institutions across Europe. They collected data from over 1,000 VE participants and analyzed the data with both quantitative (questionnaire) and qualitative research instruments (e.g. learning diaries), focusing on the students' digital, intercultural, and linguistic competence development, as well as their learning experiences. One aspect that was studied by The EVALUATE Group (2019) was the participants' perceptions of challenges during the VE. Technological issues, student resistance, time management, task design, intercultural issues, and mismatch in the teachers' pedagogical approaches were reported as some of the main areas of difficulty. However, the findings also indicated that the collaborative hurdles and challenges had motivated the students to find creative solutions to collaborate and communicate successfully with their international partners.

Glimäng (2021) explored pre-service English teachers' self-reflections as participants of VE, based on data from e-diaries and interviews. As part of her findings, the author pointed out how power dynamics among the participants were shaped by expectations and perceived differences in English language proficiency. Students reflected on both rewarding and frustrating experiences regarding

the use of English as a lingua franca during the online exchange. In addition, [Glimäng \(2021\)](#) found that the students' interpretations of online politeness and their participation through digital tools often led to critical incidents and misunderstandings between the group members.

In VE, there have been examples for multisensory projects ([Satar, 2021](#)) and multimodal reflections. [Murdoch-Kitt and Emans \(2021\)](#), for instance, developed several visual thinking activities such as a value collage to support collaborative international learning. As an end-of-project reflection activity, [Kurek and Müller-Hartmann \(2018\)](#) included the task of visual interpretations of the students' critical incidents in the magnifying glass activity ([Kurek & Müller-Hartmann, 2018](#); [The EVALUATE Group, 2019](#)). As described by the authors, the activity was used in the final class of the VE projects that were arranged between TESOL teacher trainees from Germany and Poland. The participants had to pick a critical incident (either positive or negative, see [Kurek & Müller-Hartmann, 2018](#)) that they experienced during the VE and draw it under a magnifying glass. The students' solutions were then shared for discussion, interpretation, and feedback in the final group meetings.

The study of [Kurek and Müller-Hartmann \(2018\)](#) introduced the task as part of the pedagogical design of VE but did not include a thematic and social semiotic analysis of the reflections. Our study addresses this gap by drawing on data from a project-closing activity, namely the visualization of a magnifying glass reflecting a critical moment in its focus.

6. Methods

The aim of the present study was to explore what students perceived as critical moments during VE. The research also served as action research ([Cousin, 2009](#); [Stringer, 2013](#)) because we were the teachers who planned and facilitated the VEs. The dual perspective of a teacher and a researcher allows for the research-based development of teaching practices and thus can lead to better pedagogical design and solutions ([Cousin, 2009](#)). Research also benefits from the dual perspective because familiarity with the context helps the interpretation of the findings. Regarding VE projects, another advantage of action research is that it enables a deeper understanding of the complexities of online international collaboration ([Kurek & Müller-Hartmann, 2019](#)).

Our research questions were as follows:

- (1) What themes did the students present as critical VE moments in the magnifying glass activity?

(2) What semiotic resources did the students use to create meaning in their visual reflections?

6.1. Participants and context

Data was collected from three VE projects, all based on the same general topic and similar pedagogical design, in a period of three years. The titles of the projects were different because there were minor changes in the topic across the years (see Table 1).

Table 1. VE projects on tourism

	2019	2020	2021
Project title	A Tale of Two Cities Told in Videos: Combining Expertise in Linguistics and Tourism	City-break in Europe: Understanding Tourists' Needs and Motivations	City exploration: Emerging Tourism Trends in the Covid-19 Era
Countries	Poland, Finland	Poland, Finland, Netherlands	
Number of participants	25	32	40
Participants/country	13/PL, 12/FI	14/PL, 7/FI, 11/N	15/PL, 14/FI, 11/N
Disciplines	tourism, languages	tourism, languages, business	
Length	6 weeks	7 weeks	7 weeks
Main tasks	1) ice-breaking and team building 2) comparative website analysis and information swap 3) material collection and production 4) online exhibition, reflection, and feedback		

Note: PL=Poland, FI=Finland, N=Netherlands

In all three projects, the students majoring in various fields (tourism, business, and language studies) joined their forces to explore promotional discourse in city tourism. Using various digital tools, the international groups of five to six students worked online for six to seven weeks. The groups were formed by the teachers at random but with consideration for having participants from each of the universities. In one of the first tasks, they critically analyzed official websites of their municipalities, focusing on the language, graphics, marketing strategies, and general appeal. Additionally, in 2021, when the pandemic was well under way, the students had a closer look at how new virtual forms of tourism were promoted on these websites. The final product was a multimodal text (e.g. a video, an online magazine, a social media account) in each year. In 2019, the students collaboratively designed a tourism offer addressed to young travelers like themselves; in 2020, they tailored the offer to meet the needs of a chosen generation (such as gen-X or gen-Y); and in the third project, in 2021, the students developed personalized virtual tours of their cities as a response to the COVID-19 pandemic. In all the three projects, the students could choose a digital genre of their choice (e.g. video, online magazine, blog, or online poster) to create the group product.

6.2. Data collection methods

The present study draws on data collected from a project-closing, reflective task. The general idea of this activity was adopted from [Kurek and Müller-Hartmann \(2018\)](#) and [The EVALUATE Group \(2019\)](#). The students were asked to draw a big magnifying glass and reflect on an important incident (a critical moment) that they had experienced in the VE. Their task was to present it under the magnifying glass. The ‘critical moment’ was described by the teachers as something positive or negative – yet always very important for the learning process. However, unlike in the task design described in [Kurek and Müller-Hartmann’s \(2018\)](#) study, writing was not excluded as a mode: the students could use words and short written expressions to accompany their graphic works. Moreover, they could use any form of graphic creation (pen and pencil, digital drawing, photos, cut-outs, collage, etc.).

The students shared their magnifying glasses on the VE platform for all participants to see and reflect on. In total, 76 glasses (n=13 in 2019, n=29 in 2020, and n=34 in 2021) were added to the corpus. Data was collected and handled following the responsible conduct of research and the ethical guidelines of the three institutions. Informed consent was obtained from all participants in the study and data was stored in password-protected files. Confidentiality was achieved by removing personal identifiers from the data.

From the 76 magnifying glasses, eight examples were selected based on non-probability and purposeful sampling ([Palinkas et al., 2015](#)). As our aim was to explore the semiotic resources used for meaning making, we selected the magnifying glasses that, in our view, were interesting and insightful examples of the main themes.

6.3. Methods of data analysis

The analysis was carried out in two stages as shown in [Table 2](#) below.

Table 2. Research questions and methods

Research question	Data	Method of analysis
What themes did the students present as critical VE moments in the magnifying glass activity?	76 magnifying glasses	qualitative content analysis, coding (Zhang & Wildemuth, 2009) (Hennink, Hutter, & Bailey, 2020)
What semiotic resources did the students use to create meaning in their visual reflections?	8 magnifying glasses	social semiotic analysis (Kress, 2010 ; van Leeuwen, 2005)

In order to answer the first research question on the themes that the students presented in the magnifying glasses, we used qualitative content analysis, drawing on [Zhang and Wildemuth \(2009\)](#), and [Hennink et al. \(2020\)](#). Following the framework of data-driven, circular research design ([Hennink et al., 2020](#)) and conventional content analysis ([Hsieh & Shannon, 2005](#)), we first created a corpus of the 76 magnifying glasses and then familiarized ourselves with the data. Based on our observations and inductive reasoning, we developed codes for description and comparison across the data sets, generating categories. The unit of analysis was a theme, which could be expressed in verbal as well as in visual resources. As suggested by [Zhang and Wildemuth \(2009\)](#), we developed a coding scheme and tested it on a data sample. Next, we discussed and refined the codes by clarifying and defining the categories to increase the validity of manual coding (see the coding table in the Appendix).

Subsequently, we went through the data and coded our corpus based on the previously agreed on coding categories. Although our main research approach was qualitative, we applied a frequency count of the coded categories to provide an overview of the data. As pointed out by [O'Dowd \(2021\)](#) and [Weber \(1990\)](#), qualitative content analysis can integrate quantitative practices.

In the second stage of the analysis, we chose eight samples that illustrate the most dominant themes identified in the first analytical stage and analyzed the selected magnifying glasses with the help of multimodal social semiotic analysis ([Kress, 2010](#); [van Leeuwen, 2005](#)). This step was made to answer our second research question: What semiotic resources did the students use to create meaning in their visual reflections? We understood the magnifying glasses as multimodal ensembles and sign complexes ([Kress, 2010](#)) and focused on the use of semiotic resources. Our understanding of semiotic resources originated from van Leeuwen's definition: "the actions and artefacts we use to communicate" ([van Leeuwen, 2005](#), p. 3). More specifically, we analyzed the use of visual and linguistic resources based on [Kress \(2010\)](#). Among visual resources, we studied saliency, colors, images, facial expressions, gestures, and gaze (if relevant). When examining the linguistic resources, we considered word choice, syntax, and punctuation.

7. Results

7.1. Overview of the themes representing critical moments

In total, 76 magnifying glasses were coded based on the coding system introduced in the Appendix. We allowed for the identification of more than one theme in a magnifying glass. The distribution of the coded themes is shown in [Table 3](#).

Table 3. Themes identified in the magnifying glasses

Code	Theme	2019	2020	2021	Total number of magnifying glasses with the theme	Percentage of magnifying glasses with the theme
01	Production and collaboration	5	7	13	25	32.9%
02	First meeting	5	7	6	18	23.7%
03	Project-closing	1	1	3	5	6.6%
04	Changes and unexpected events	1	7	2	10	13.1%
05	Communication and language	4	7	3	14	18.4%
06	Motivation and expectations	0	2	0	2	2.6%
07	Technology and digital skills	0	3	1	4	5.3%
08	Creativity	0	3	0	3	3.9%
09	Self-reflection	0	3	1	4	5.3%
10	Culture and tourism	0	1	7	8	10.5%
11	Other	0	0	2	2	2.6%
Number of magnifying glasses		13	29	34	76	
Number of times a theme was coded		16	41	38	95	
Theme/glass		1.23	1.41	1.12	1.25	

From Table 3, which displays the distribution of the 11 themes over a three-year period, several observations can be made. The four most prominent themes include: *production and collaboration* (32.9%), *first meeting* (23.7%), *communication and language* (18.4%) and *changes and unexpected events* (13.1%). Further distribution includes *culture and tourism* (10.5%), *project-closing* (6.6%), *technology and digital skills* (5.3%), *self-reflection* (5.3%), *creativity* (3.9%), *motivations and expectations* (2.6%), and *other* (2.6%).

Interestingly, the distribution of the categories over the three-year period differs. There were several themes that only emerged in one of the three years only, for example, the theme *motivation and expectations*, which was more prominent in 2020 but was not represented in the other two years. Other prominent themes that were more central to the project of 2020 were *changes and unexpected events* and *communication and language*. In our view, the prominence of the theme of unexpected events could refer to the start of the global COVID epidemic. It was in the spring term of 2020 that teaching at all the three universities moved online due to the COVID-19 pandemic. The groups suddenly had to modify their original plans for the data collection as they could not move around freely in the cities to take pictures or take videos. The students informed us about this, and we discussed the challenges and the potential solutions with them in class. In 2021, this was not an issue anymore because the experience of the COVID-induced constraints on physical mobility

were not new and the groups planned their data collection accordingly, for example, they used photos taken years earlier.

In response to the second research question on the use of semiotic resources in the magnifying glasses, we are going to discuss eight examples from the data, which represent the most frequently occurring themes: *production and collaboration*, *first meeting*, *communication and language*, and *changes and unexpected events*.

7.2. Critical moments: a closer look

7.2.1. *Production and collaboration*

Production and collaboration manifested as the leading theme in all three projects. It was identified in 25 (32.9%) magnifying glasses. To deliver a product requires several skills including conceptualizing, planning, experimenting, and implementing. This can be a challenging experience, especially when realized collaboratively and remotely. The online groups have to build team spirit, schedule meeting times, make joint decisions, divide the workload, and create the final product, using technology and a lingua franca. In our projects, collaboration was fostered from *Week 1* when students scheduled subsequent meetings, established ground rules, and appointed leaders for each week. Then they conducted research relating to the three cities, analyzed data, and wrote reports. Production involved conceptual work, developing the prototype and uploading the final product on the VE platform for the online exhibition.

In [Figure 1](#), some production elements are outlined verbally. The hand-drawn magnifying glass includes verbal resources, ‘material discussion and production’, making a clear reference to the weekly group discussions and to the production of the final product itself. The students had to agree on the types of materials that they collected for their promotional product which could be a video, online magazine, exhibition, or blog, and meet the deadline for the online exhibition. This experience might have been perceived as critical because some material was to be used and some other elements were to be eliminated. Our insider view as teachers in these projects make us assume that this process of elimination might have been emotionally difficult for some of the students who did their best to get the ‘right’ material that was to be eliminated right before the production.

In the image below, there is no indication of stress depicted in the glass, one can deduce that the process followed a logical flow. Instead of a full sentence, only words are used, and they are positioned as salient, being in the center of the image. The lack of a sentence structure creates a

sense of timelessness. The colors used for drawing the magnifying glass are pink and purple, and the drawing is slightly schematic, lacking depth of detail. No humans are presented either verbally or visually, which can imply a sort of distancing and objectification.

Figure 1. Theme: *production and collaboration* (2021 nr. 26)

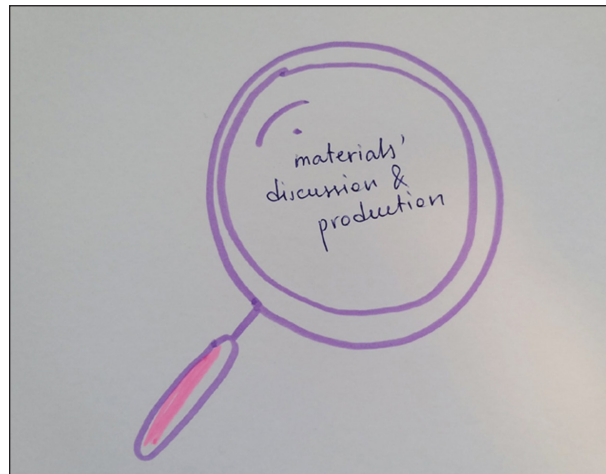


Figure 2. Theme: *production and collaboration* (2021 nr. 10)



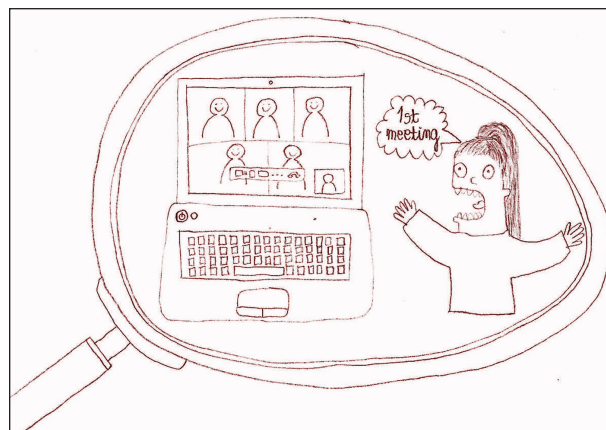
In contrast to the previous image, [Figure 2](#) does depict humans, in the form of the smiling personas presented in the left-hand side of the glass. A distinct notion of a group is implied by the five faces,

drawn close to one another. Furthermore, there is the text “Video done!”, with the exclamation mark giving emphasis to the message. The critical moment here is clearly the completion of the project in the form of a video that this group created. All the group members are smiling in the drawing: it is their faces that are salient. There is an indication of positive emotion which can be happiness, satisfaction, sense of achievement, or pride. The colorfulness of the image and the facial expressions confirm the presence of positive emotions resulting from achieving something together as a group.

7.2.2. *First meeting*

The second most frequently described critical moment was the *first meeting*. As a theme, it appeared in 18 (23.7%) magnifying glasses. In the context of the three VE projects, the first meeting could refer either to the first video conference with all participants (including the teachers) or to the first video call with one’s group members. The two types of meetings happened in the same week. Since the groups had freedom to select the day and the time of their meetings, the group video calls could have taken place before or after the opening video conference. In some magnifying glasses, therefore, it was not possible to determine which type of meeting was being referred to when verbally conveying the meaning of a ‘first meeting’ (see [Figure 3](#)). However, the theme of getting to know new people through the computer screen was characteristic of both types of meetings.

Figure 3. Theme: *first meeting* (2020 nr. 31)

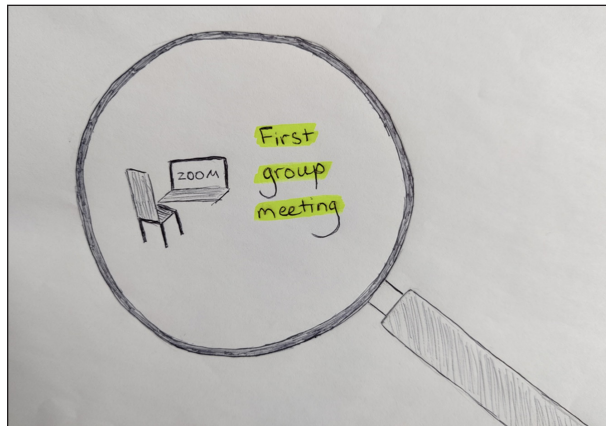


[Figure 3](#) depicts a student who drew herself in the right side of the image, next to her laptop, which shows an on-going video meeting. There is a great contrast in the facial expressions of the other

participants and that of the student. While those on the screen are smiling and thus seem to be happy and balanced, the student looks scared or even frightened. Her mouth is open as if she was crying out for help (even her tongue and teeth are visible), and her arms are wide open, perhaps to express a wish to be rescued from this situation. She presented herself in detail: a ponytail, teeth, both hands, five fingers, while the other students on the screen all look the same – happy, unknown figures without gender or individual features. With the use of verbal resources “1st meeting”, the student made it clear what caused her emotional reaction. It is interesting to observe the detailedness of the laptop: the precise depiction of the keyboard with the touchpad, the power button, and the icons on the screen.

Another example is from the 2021 project (Figure 4), which does not show any humans, only an empty chair, a laptop with “Zoom” on its screen and a brief text “First group meeting” highlighted in yellow.

Figure 4. Theme: *first meeting* (2021 nr. 15)



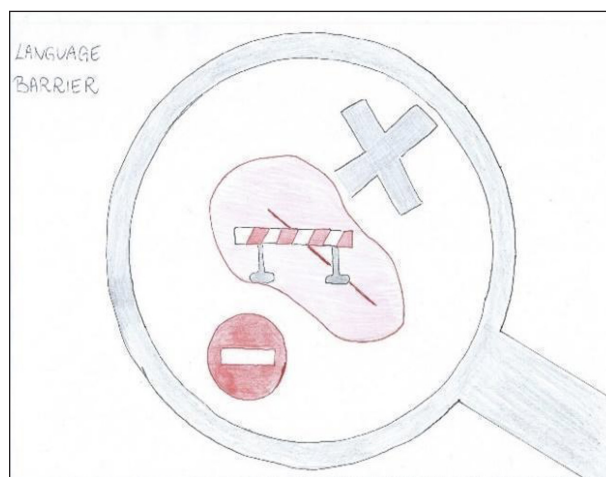
The focus in Figure 4 is on the physical situation or context of a Zoom video meeting. The emptiness of the chair and the lack of details (e.g. no human faces on the screen, no stand or desk under the laptop) may imply isolation and a lack of connections. While in the previous picture the group was a collection of identical bodies, here no bodies are present: the group is even more impersonal, distant, and foreign. Just like in Figure 3, the technology is in the focus, as expressed by the capital letters “ZOOM” written on the laptop screen. In the spring term of 2021, when the third project took place, the students had been used to video meetings because all the three universities involved had switched to remote education in 2020.

7.2.3. *Communication and language*

In any project, where there are multiple mother tongues involved, language is a common denominator. In the VEs discussed in the present study, the main languages comprised Polish, Finnish, and Dutch, and there were also a couple of students with other mother tongues, for example, Chinese, German, or Russian. English was used as a lingua franca, but some participants felt that their English language proficiency was not up to standard and on par with the rest of the group. The category of *communication and language* in the context of this project can refer to and include perceived communication barriers such as lack of understanding of non-verbal communication, communication barriers due to technology, and differences in English language proficiency. As a theme, it was present in 14 (18.4%) magnifying glasses.

Figure 5 clearly illustrates several visual and linguistic resources that signify the existence of a language barrier as a critical moment. It is an ensemble of multiple icons and signs.

Figure 5. Theme: *communication and language* (2020 nr. 12)

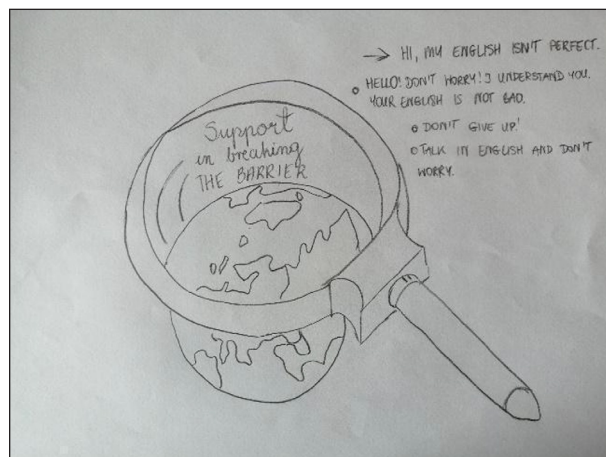


The hurdle placed over the tongue and the additional signs (the “No entry” traffic sign and the cross) supplemented by the text “language barrier” highlight the fact that there is a strong language barrier. It can be understood as ‘don’t go there’: the level of the language is too high, and you do not have enough ability to cope with the challenge. The use of the capital letters as verbal resources can function as an objective statement or claim, for which there is visual explanation under the magnifying glass. Red is the only color used in addition to gray, which can be a reference to ban or

prohibition. The perceived inability to articulate oneself in a situation with foreign team members can culminate in high levels of anxiety and fear (Háhn, 2021). Based on our views and experiences as teachers of VE projects, if this is not addressed, the outcome can be withdrawal from scenarios that require communication, or in more severe circumstances withdrawal from the project itself.

Figure 6 is another example where overcoming the language barrier is depicted as a critical moment. Clearly there is openness the student is outlining a critical moment where they exposed themselves as vulnerable by indicating a lack of language proficiency.

Figure 6. Theme: *communication and language* (2020 nr. 8)



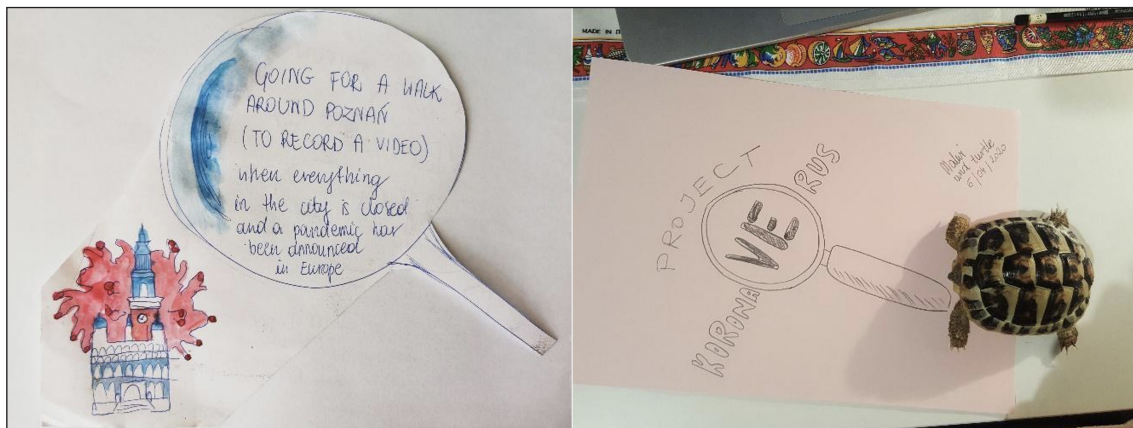
Clearly discernible from the magnifying glass is the level of support offered by the team members as expressed in the written text “Support in breaking THE BARRIER” under the glass. There are no human faces in the drawing to refer to the team itself, but the idea of ‘global connectedness’ is conveyed by the hand-drawn globe, suggesting that there is support and understanding coming from afar. Peer support is expressed in an imaginary (or real?) dialogue between two students. “Hi, my English is not perfect. / Hello! Don’t worry! I understand you. Your English is not bad. /Don’t give up! / Talk in English and don’t worry”. One student is encouraging the other to be open and to communicate freely, irrespective of whether there are language and grammatical errors in the communication. The message of Figure 6 is perseverance and persistence regardless of the language proficiency differences. This glass illustrates group support and encouragement, which helped to overcome a seemingly challenging situation. The critical moment here is not the existence of the language barrier per se but breaking the barrier and receiving group support.

7.2.4. Changes and unexpected events

In VE, things do not always happen as planned. Although the teachers are available for support and guidance, the groups are expected to work independently and be self-reliant, for example, in planning and creating the main product. Several factors may jeopardize the realization of the group's original plans such as drop-outs, internal conflicts, overlapping schedules, or even bad weather. Such unexpected events can force the group to make modifications, which might be experienced as critical incidents for some.

The theme of *changes and unexpected events* was the fourth most frequently occurring theme, expressed in ten (13.1%) magnifying glasses, most of which (seven) were from 2020. In spring 2020, the COVID-19 pandemic hit in the middle of the project, when the groups had already planned their material collection for their promotional tourism product (video, online magazine, social media account). Most of the students could not proceed with taking pictures or making video recordings in their cities because contact teaching ended and they traveled home, leaving the campus and the city. They were also afraid to spend time in public spaces because of potential exposure to the virus. Many of the magnifying glasses from 2020 reflect on the outbreak of the pandemic as a critical moment (Figure 7).

Figure 7. Theme: *changes and unexpected events* (2020 nr. 4 and nr. 16)



The first image shows one of the main sights of City Poznań, the town hall, with the symbol of the coronavirus in the background that spreads like fire. The text on the magnifying glass says, “Going for a walk around Poznań (to record a video) when everything in the city is closed and a pandemic

has been announced in Europe”. The student refers to the difficulty of collecting material for a video during the lockdown. The big red and spiky virus drawn behind the town hall is the most salient part of the composition, to which the written text adds an explanation. The second image also has the coronavirus as its central theme. It builds on wordplay “Korona VE rus”, combining the words ‘coronavirus’ and VE. The student took a picture of their own drawing and their turtle next to it, the only companion at the time of lockdown and isolation.

8. Discussion

The aim of our study was to explore what students perceived as critical moments in VE, drawing on visual reflections collected from three projects (2019, 2020, and 2021). We raised two research questions: (1) What themes did the students present as critical VE moments in the magnifying glass activity, and (2) what semiotic resources did the students use to create meaning in their visual reflections?

Our first research question was answered based on the themes’ frequency in the data. Four key themes were found as central: *production and collaboration*; *first meeting*; *communication and language*; and *changes and unexpected events*. There were also additional themes that emerged, for example, *project-closing*, *motivation and expectations*, *creativity*, *self-reflection*, *technology and digital skills*, and *culture and tourism*.

The spread of the themes we identified (more than ten) proves that students did not focus on the same joys and challenges, and perceived various moments as ‘critical’. The scope of the present paper did not allow for the discussion of all the identified themes. However, the spread of themes in terms of the critical moments is a clear indication of the individual differences in students’ perceptions. This confirms that each student has their own path to travel in VE (Háhn, 2021), and the individual experience can differ.

As teachers, we were following each project closely, had regular class meetings with the students, and read their learning diaries. In those contexts, the four key themes usually emerged as problems or areas of difficulty, especially in the initial stages of the project. However, overcoming the challenges and completing a group project was a rewarding and emotionally uplifting experience for many, as it was depicted in some of the magnifying glasses (as shown in [Figure 2](#) and [Figure 6](#)) that expressed the moment of happiness and satisfaction felt upon co-creation, adapting to change, overcoming barriers, and finishing the joint production.

In response to our second research question, we found that the students used a combination of visual and linguistic resources to express a critical moment of their choice. We looked beyond the surface of the message, studying verbal signs as well as visual ones, thus revealing more deeply the underlying structures of meaning. The analyzed samples were all hand-drawings, which depicted various objects (such as laptops, the globe, a town hall, a traffic sign) and/or humans, with the upper body and the face being central. In one of the examples (Figure 6), the drawing was photographed together with the student's pet, which brought in the student's personal lifeworld to the reflection. Verbal language was either used as the main resource for meaning making (Figure 1) or as complementary to the visual elements (Figures 2-6). In the latter cases, linguistic resources were applied to clarify or strengthen the meaning made by the visual elements.

As pointed out by Kress (2010, p. 71), all sign complexes or multimodal ensembles are metaphors, which display the interest of the sign-maker in the situated social context. The magnifying glass activity itself can be conceptualized as a metaphor because the magnifying glass displayed each student's personal perspective of the VE experience. The social context of meaning creation was the completion of an assignment in an online international collaborative project. Such projects break the routine of traditional courses and offer an opportunity for experiencing something unusual, challenging, or even risky.

Many students start a VE with mixed feelings (Háhn, 2021), because they are worried about their abilities to use a foreign language, communicate in an online setting, collaborate with strangers, use their digital skills, demonstrate their disciplinary expertise, and create new content together. First meeting fears, which might be intertwined with some positive excitement, are bound to emerge at the start. As previous studies on VE have shown, the process of group collaboration in a virtual and international learning environment is characterized by facing challenges and solving problems (Glimäng, 2021; O'Dowd & Ritter, 2006; The EVALUATE Group, 2019).

VE provides a safe space for the students to tackle the challenges and find new creative strategies of communication and collaboration. Critical learning incidents can arise also from the joy over solving a problem or getting support from a peer, as shown in some of the magnifying glasses (e.g. Figure 6). Therefore, our findings confirm Soini (2012) and Woods (1993) in that critical learning incidents are not necessarily negative. Moreover, what is experienced as a critical moment by one learner may not be seen as central by another, and this might be explained by differences in learning styles, language proficiency, and digital and other skills.

James and Brookfield (2014) state that "the hegemony of written reflection must be challenged" (p. 18) because writing can be constraining for some students. Written reflections impose

standardized expectations (e.g. on the number of pages, writing style, grammar) and limit the creative, playful, and imaginative elements in self-expression. Since multimodal reflections can feel liberating (Kalaja & Pitkänen-Huhta, 2018; Kernan et al., 2018; Murdoch-Kitt & Emans, 2021), we argue that using a visual task was a good way for expressing critical learning incidents. We believe that multimodal reflections allowed the students to express their thoughts creatively.

9. Conclusion

Our study focused on critical moments in VE, as expressed by the students in their visual reflections. The findings show that the most frequently expressed themes were related to participation in the first meeting, joint production, use of a foreign language, and adaptation to change. The students used both linguistic and visual resources for meaning making, which resulted in multimodal sign complexes. Based on our findings, we argue that critical moments in VE, though often connected with challenges, are not necessarily perceived as negative by the students as many times they refer to overcoming barriers, reaching goals, and completing tasks together. These moments can form the ground for meaningful learning situations, especially when followed by reflections.

The present study also showed that a visual task can work as an alternative and complementary form of sharing reflections. We agree with Kurek and Müller-Hartmann (2018), who emphasize the importance of the magnifying glass activity as a form of reflection. Such tasks can serve as a springboard for a discussion on what all the team members experience when working together.

One drawback of our study was that we did not ask the students clarification questions about the meanings expressed in their solutions. In future projects, the magnifying glass activity could be complemented by research interviews, giving space for the students to describe orally what they created. A further limitation was that the magnifying glasses represented what participants had chosen to show other participants, which may not have been what they would have created if magnifying glasses had been self-reflections.

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Appendix

Themes	Description	Code
PRODUCTION & COLLABORATION	data collection, editing, making decisions, selecting the platform, peer support, solving problems together, finding joint perspectives, meeting deadlines, time management, showing commitment, finishing the production	01
FIRST MEETING	getting to know new people, first impressions, saying hello, first video conference, first group meeting	02
PROJECT CLOSING	saying good-bye, online exhibition, getting feedback, final thoughts and reflections, satisfaction from participation	03
CHANGES & UNEXPECTED EVENTS	changes in the planning, changes in the data collection, changes in the production, difficulties caused by COVID-19	04
COMMUNICATION & LANGUAGE	language barrier, support in breaking the language barrier, communicating online, communication in a group, communication as bonding	05
MOTIVATION & EXPECTATIONS	personal reasons for joining the project, personal expectations regarding the skills and the learning objectives	06
TECHNOLOGY & DIGITAL SKILLS	filming, adding sound, adding music, editing the final product, reference to problems with technology	07
CREATIVITY	creating something together, being/feeling creative	08
SELF-REFLECTION	self-development, self-reflection, overcoming personal barriers, personal struggles, socio-emotional and mental states	09
CULTURE & TOURISM	cultural references, holidays, traditions, virtual travel	10
OTHER	other themes: either not identifiable or not fitting the above categories	11