Student reflections on the curriculum and citizenship education using card sorting in group settings

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ARTICLE INFO	ABSTRACT
	This reflective paper aims to illustrate how card sorting activities can be used as an educational tool to capture group perspectives, prompt reflection and endorse citizenship skills such as discussion, critical thinking, group collaboration and decision-making. For this illustration, the paper presents the results of a pilot study in which students in a higher education context conducted two different card sorting activities. In addition, the reflections and lessons learned from the case study together with literature about Diamond Ranking and Q methodology's sorting technique, are presented to highlight the potential of card sorting as a multipurpose educational tool in higher education settings. In the final section, the author reflexively contemplates future research opportunities to enhance the body of literature on card sorting activities, based on the Q methodology's sorting technique, as an educational tool.

Introduction

This reflective paper aims to illustrate how card sorting activities can be used as an educational tool to capture group perspectives, prompt reflection and endorse citizenship skills such as discussion, critical thinking, group collaboration and decision-making (Biesta, 2020; Van der Ploeg & Guérin, 2018). Researchers have explored the use of diverse card sorting activities for research and educational praxis (e.g. Conrad et al., 2019; Hopkins, 2010). As a research method card sorting activities are applied to understand participants' subjectivity, such as attitudes, perceptions and assumptions (Conrad et al., 2019). From an educational application, the prompting and facilitating characteristics of card sorting activities have been studied (Boyle & Jackson, 2009). Although researchers have explored and claimed the value of card sorting activities in different education settings (e.g. Conrad et al., 2019; Hopkins, 2010; Lundberg et al., 2020), there is a lack of studies on the actual application as such. This paper aims to showcase the practical application of how card sorting activities can be used as an educational tool in higher education.

The case study, presented in this paper, applied two different card sorting activities with Bachelor students from Saxion University of Applied Sciences, the Netherlands. This case study is part of a larger research project. Drawing on the experiences of the case study, the

reflections and insights are presented in this paper to illustrate the practical application of card sorting activities in higher education. It should be mentioned that the contributions of this paper are more practical than academic, the reflections and insights presented in this paper are not the results of a systematic study. The literature to support and supplement the reflections and insights stems from empirical studies which conducted card sorting activities in diverse educational settings, with a specific focus on Diamond Ranking and the sorting technique of Q methodology.

Card sorting activities in education

Researchers applying the card sorting methods have praised the characteristics of the method, stating that the card sorting prompts participants to reflect on the topic given on the cards (Wolf, 2022) and communicate their perspectives, with the sorting activity as a facilitation tool to construct a narrative (Boyle & Jackson, 2009; Fincher & Tenenberg, 2005). Besides these prompting characteristics, card sorting activities are also favoured for their easy administration and flexibility in using more than only written cards (Conrad et al., 2019; Wolf, 2016). The cards to be sorted can be easily adjusted between text, images and objects (Boyle & Jackson, 2009; Conrad et al., 2019; Lundberg et al., 2020). This flexibility of the sorted materials makes the sorting activity

suitable for educational settings ranging from primary education (Niemi et al., 2015) to higher education (Sklarwitz, 2017).

There is a large variety of card sorting activities and how these are applied in research and educational praxis (Conrad et al., 2019). As research options, Diamond Ranking and the Q sorting technique from the Q methodology are the most well-known card sorting options. Diamond Ranking is also referred to as "Diamond of 9″ because this card sorting activity requests participants to sort a set of nine cards in order of significance to the participant on a diamond-shaped grid (Clark, 2012; Rockett & Percival, 2002). Some researchers have attempted to use more than nine items, varying from 13 (Hopkinks, 2010) up to 30 cards (Hobby, 2004). Q methodology allows sorting more items, thereby providing more aspects of a topic to be considered. The average number of items to be sorted in educational Q studies is 40, ranging from 15 to 79 items (Lundberg et al., 2020).

Besides this difference in the number of items to be sorted, the analyses of the completed sortings between Diamond Ranking and Q sorting differ. Diamond Rankings are analysed by calculating the average row of each item (Hobby, 2004; Niemi et al., 2015), reducing the sortings to which items are ranked the highest and lowest. Traditionally, Q sortings are factor analysed, identifying shared perspectives between participants (Stephenson, 1935; Watts & Stenner, 2012). For example, if a teacher would want to evaluate a course and identify distinctive students' perceptions regarding the course, the full application of the Q methodology including factor analysis is required (e.g. Ramlo, 2015).

From an educational perspective, it could be assumed that identifying and understanding distinct student perceptions is not the main goal of card sorting activities. Instead, the prompting and facilitating characteristics of the card sorting activity are of interest to educators (Boyle & Jackson, 2009). Via the card sorting activities, teachers are provided with a hands-on practical tool that allows for a structured approach to reflection and discussion (Boyle & Jackson, 2009; Fincher & Tenenberg, 2005). Regarding Q methodology and more specifically Q sorting, only a few researchers and Q methodologists have written about the mechanism of Q sorting and how the sorting activity can be used as an educational tool to prompt participants to reflect (Mulder et al., 2019; Rimm-Kaufman et al., 2006; Sayeski & Higgins, 2014). An explanation could be a publication bias because reducing a Q study to merely a (Q) sorting activity does not serve the purpose of the methodology to study the participants' subjectivity (Rieber, 2020). Despite this critique of downscaling Q methodology, researchers have praised Q methodology and the sorting activity for its applicability in education. For example, the sorting activity allows students to understand their perspectives and find similarities in viewpoints (Lundberg et al., 2020). In addition, card sorting activities in the classroom can be used as a tool to expose prejudices and start a dialogue (Duncan & Owens, 2011). Some researchers have suggested, based on conducted Q studies and piloting group Q sorting activities, that the sorting activity holds the potential to facilitate discussion and reflection in the classroom (de Leeuw et al., 2019; Duncan & Owens, 2011; Owens & Duncan, 2009). This suggestion is in line with the application of Q sorting as a conflict resolution tool (Lo Bianco, 2015) or a dialogical tool (Wolf, 2016). As a dialogical tool, the card sorting activity provides the opportunity to start a dialogue between the participant and the researcher (Wolf, 2016). The sorting activity facilitates the possibility of a dialogue between participants when individual sortings are compared amongst each other or to create a group sorting (Duncan & Owens, 2011; Owens & Duncan, 2009).

Case study

In 2020 a pilot study[2] was conducted to capture the experiences and perceptions of students regarding citizenship education in authentic learning environments (ALE) at Saxion University of Applied Sciences. Part of this ALE at the University's curriculum is that students get acquainted with assignments from practice, to gain experience and develop their citizenship skills. Teaching higher education students skills that prepare them to become critical young professionals who can make decisions which are according to the moral and ethical standards of their profession, is not a new phenomenon (De Ruyter & Schinkel, 2017; Van Stekelenburg et al., 2021). In the Netherlands, a significant part of the curriculum in higher education settings has put a strong emphasis on the development of citizenship skills such as critical thinking, group collaboration and group decision-making (Guérin, 2018; ten Dam et al., 2010). In didactical terms, this puts a strong focus on their personal, social and moral development and the reflection skills of the student. At Saxion University of Applied Sciences, the implementation of ALE has been one of the recent curriculum changes. In the ALE students receive socially relevant assignments (Herrington & Herrington, 2014), such as "design an app for citizens that would support the production of less waste, by stimulating to better separate the waste" or "provide a solution for the conflict between large real estate agents and preserving the historical view and feeling of the city centre". The assignments in the ALE are provided by clients who collaborate with the local municipality and the University of Applied Sciences. The impetus for group sorting activities in this pilot study is twofold; 1) to assess students' perceptions about citizenship education in the ALE and 2) to explore the possibilities of group sorting activities as an educational tool fostering citizenship skills. This paper will focus on the latter aspect of card sorting activities as an educational tool.

Method

Design pilot study

Three multidisciplinary groups consisting of fourteen Bachelor students and their three mentors voluntarily participated in the pilot study (see Table 3 for descriptive information). The data were collected from October to December 2020, in online settings due to Covid-19 restrictions. Fig. 1 provides an overview of the design of the pilot study. The students conducted two different card sorting activities. These card sorting activities were based on the Q methodology sorting technique and Diamond Ranking. Besides the two sorting activities, the students also participated in a Socratic conversation to assess their degree of citizenship skills. In the last session for the students, the students would reflect on and evaluate each activity and session of the pilot study. The sorting activity conducted with the mentors is not included in this paper, as this is not part of the focus of this paper.

Applied card sorting activities

In line with Q methodological studies, the development of the set of statements (known as concourse and Q sample in Q methodology) was culled from the body of literature regarding citizenship education. For the purpose of the pilot study, the focus was on skills practised and developed regarding citizenship education. This resulted in an overview of twelve citizenship skills. Three educational researchers with expertise in citizenship education reviewed the twelve skills formulated in statements. Based on their input, a few wording adjustments were made.

Each card sorting activity had the same underlying construction. In

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[2] In this paper the term [pilot study] is used to refer to the larger study. The term [case study] is used to refer to the card sorting activities, which are the main focus of this paper.
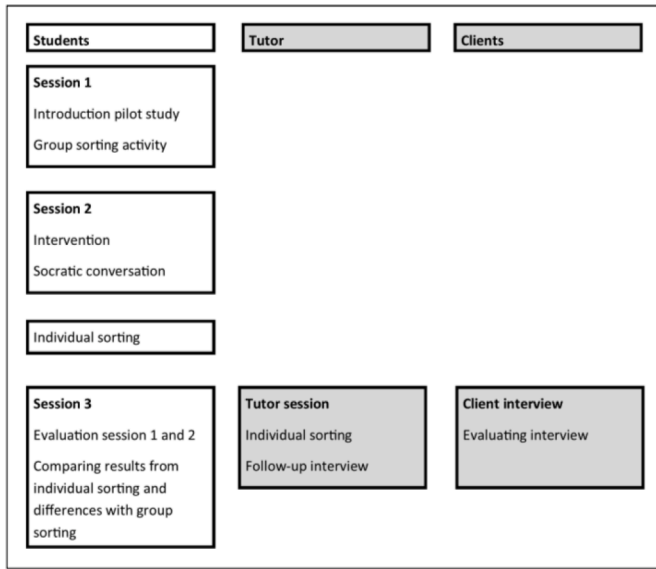
Fig. 1. Pilot study design*, *Note: Grey boxes are secluded for this paper.

the group activity, students sorted the statements to reflect which skills they had *learned* within the supervision of the ALE. In the individual sorting activity, the students sorted the statements to what they found the most essential skills to be *taught* within the ALE. Both sorting activities consisted of twelve citizenship skills, which needed to be ranked on a fixed figure shaped like a diamond (Rockett & Percival, 2002). The same twelve statements were used to prompt the students reflections, but the wording was slightly adjusted per statement to fit the sorting scale (see Table 1). Within the pilot study, the deliberate choice was made, to offer the students to reflect in the third session on the differences between the citizenship skills they had learned and would like to have learned.

As a sorting grid, the shape of the Diamond Ranking was selected over the bell-shaped grid, which is commonly used in Q methodology (Watts & Stenner, 2012). In designing the study, the decision of the diamond shape over the bell shape was made with the group setting in consideration. In the group setting the grid would be placed in the

Table 1
Overview of the Q sample.

	Group sorting *"During the ALE assignment, we learn:"*	Individual sorting *"For the ALE assignments, I find this skill essential to be taught:"*
Item *		
1.	to think from different perspectives.	think from different perspectives.
2.	to give space to other opinions.	give space to other opinions.
3.	to reason and argue with each other.	reason and argue with each other.
4.	to reflect upon our assumptions.	reflect upon our assumptions.
5.	to think about the reliability of the information.	think about the reliability of the information.
6.	to reason based on facts.	reason based on facts.
7.	to acknowledge that it is possible to change your opinion.	acknowledge that it is possible to change your opinion.
8.	to acknowledge that insight can change over time.	acknowledge that insight can change over time.
9.	to collaborate.	collaborate.
10.	to make decisions as a group.	make decisions as a group.
11.	to think about what is desirable for the common good.	think about what is desirable for the common good.
12.	to deal with resistance.	deal with resistance.

* Note: items are based on Biesta (2020), Jeliazkova (2015), Schuitema et al. (2008), Ten Dam et al. (2010), van der Ploeg and Guérin (2018)).

middle of the table and the orientation of the scale would be different depending on the position of the participant at the table.[3] In addition to this design choice, previous experiences with the bell-shaped grid were taken into account in which participants indicated that they were confused about the direction of the scale. For coherency, the individual sorting activities also used the diamond-shaped grid. Fig. 2 shows an example of a completed group sorting in the diamond-shaped grid.

Group sorting

The group sorting activity took place in the pilot study's first session. The students were instructed to sort the twelve citizenship skills on the diamond figure from the 'skill most learned' (+2) to the 'least learned skill' (−2) in the ALE (see Fig. 2). The sorting grid and the twelve skills were available during the session on a Microsoft Teams Whiteboard. Everyone in the session could drag and drop a statement onto the grid. The group sorting activity was based on the principles of Diamond Ranking, with the aim that the final sorting represented the group's perspective. This specific aspect of the sorting activity requires students to elaborate on their ranking choices until a group decision was reached (Hopkins, 2010; Niemi et al., 2015). During the sorting activity, participants argued with each other over the position of a statement. When a statement was placed on the grid, it could be re-distributed based on a discussion. The participants would ask each other for explanations and reasonings about initial placements or suggested statement shifts. Together they would weigh the argument for a position and decide if the new place on the grid was a better fit. When all twelve statements were placed on the sorting grid, the session leader would ask for confirmation. This confirmation acted as a final check to ensure that everyone could identify with the sorting of the statements or that someone was left with additional remarks. None of the participants raised the issue that the sorting was a group effort and represented the group's perspective on learned citizenship skills in the ALE but did not match their personal perspective.

After the sorting activity was completed, the participants had the opportunity to add additional citizenship skills they learned but were missed, according to their perspective, in the set of twelve skills. These additional statements were then placed along the side of the sorting grid, matching the scale of how much the missed skills were learned during the ALE. The following skills were added by the participants: *learning to plan, writing texts for reports and clients, working independently as an individual and as a group, communicating with clients, taking initiative, and utilizing (personal) networks.*

Individual student sorting

The individual student sorting activity was part of the third session, which took place after the intervention in which the students explicitly experienced which citizenship skills can be practised and taught within an ALE (the Socratic conversation). This session was specifically designed as a reflection session, with the individual card sorting activity as a prompting tool for the students to reflect on their perceptions of which citizenship skills they found the most essential to be taught during the ALE, as a preparation for becoming a critical young professional who makes decisions "according to the moral standards and specifically the standards of their profession" (Van Stekelenburg et al., 2021, p.97). The same twelve citizenship skills, with small phrasing adjustments (see Table 1), were sorted on the diamond-shaped grid with the instruction to sort the statements from 'the most essential skill' (+2) to be taught during ALE to 'the least essential' (−2). Participants conducted this sorting activity before the third session and had the opportunity to

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[3] It should be noted that when designing the study, there was no COVID-19 pandemic. When conducting the study, the sessions were online but the choice of the sorting grid remained the same.
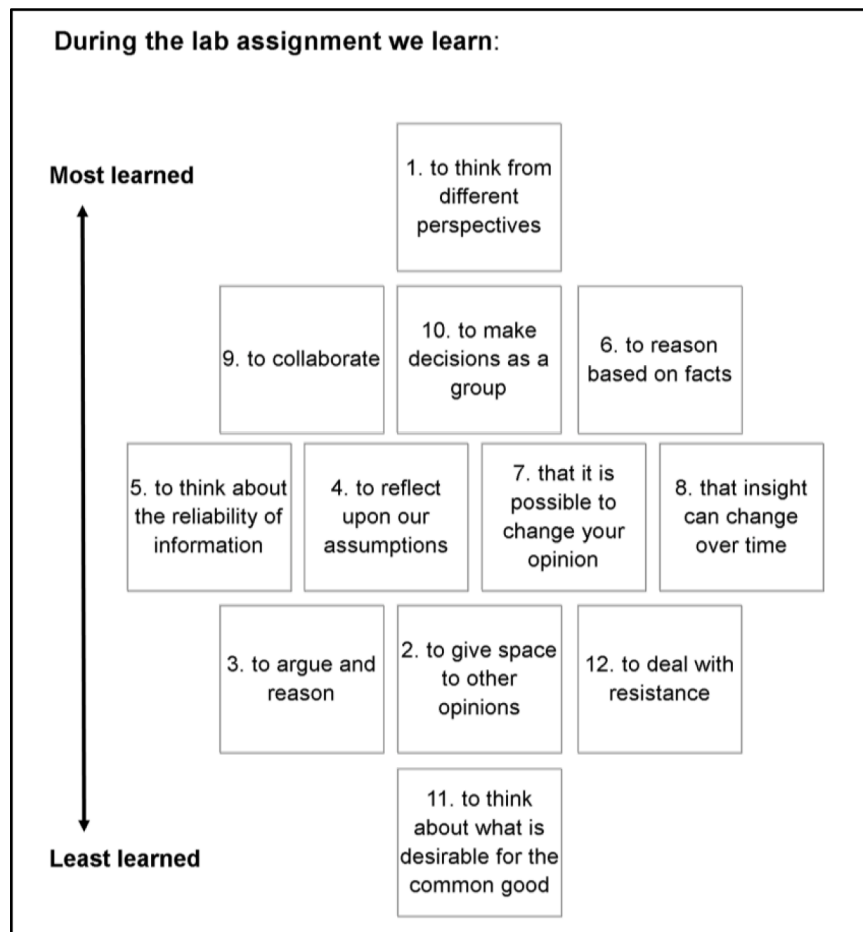
Fig. 2. Example of the ranking grid and items.

conduct the activity either online in a prived Teams Whiteboard area, in Microsoft Word or print the sorting materials and submit a photo of the completed sorting. Additionally, participants were asked to submit a written motivation for their choices at the 'most essential skill' (+2) and 'least essential (−2). No additional skills were added by the participants in the individual sorting activity.

Socratic conversation

Originally in the case study, the Socratic conversation was designed to be the intervention session. Via the Socratic conversation, the students would be explicitly introduced to applying citizenship skills. In the session, the students would explore the individual, group and professional perspectives and biases regarding a moral problem. This problem was provided before the start of the intervention session by the group members and entailed a moral problem they encountered within their ALE project. The students would be prompted and supported by the session leaders with follow-up or further exploring questions about the provided (ethical) reasoning, arguments and solutions for the moral problem.

During the first part of the session, the moral problem was introduced in more detail. Via discussions and questions, proposed by the students or session leaders, the problem or underlying dilemma would be further explored. When the moral problem was clear for each student, the session leader would ask the students to do a quick context and stakeholder analysis, map situational facts, identify prejudices and involved stakeholders. Consequently, the students were asked to indicate what the motivation and short- and long-term benefits were for the stakeholders. Regarding the moral problem, students could also be

identified as a stakeholder, either individually or as a group. When the context and stakeholder analysis was completed, the students were asked to brainstorm several solutions for the moral problem. This brainstorming would be followed by exploring which solution would be the best fitting option for the moral problem. Each student was requested to provide argumentations for their preferred solution. During this part of the Socratic conversation, the students were prompted to have a discussion with each other to reach a group decision. At the end of the Socratic conversation, the participants would reflect on which insights they gained from the intervention regarding citizenship education skills and if these skills are practrictised and fostered in the ALE curriculum.

Data collection

Because of restrictions due to the COVID-19 pandemic, all sessions took place online via Microsoft Teams. Present at each session were two session leaders, one would guide the sorting activities and the Socratic conversation, while the second session leader would mainly observe and support the first session leader. The session leaders were all researchers with an educator role from Saxion University of Applied Sciences. The author of this paper was one of the session leaders and attended all sessions, either as first or second session leader. Each session was recorded with active consent to collect the participants' verbal responses, specifically, the responses made during the group card sorting activities, the after-talk after completing the group sorting activity and the evaluation session. All students participated in the last session (evaluation, see Fig. 1). Yet eleven of the originally fourteen individual sortings were submitted with active consent to be used for research

purposes. All students did give (active) consent for the group sorting to be used for research purposes.

Data analysis

For the analysis of the diamond-shaped grid, the distribution of +2 and −2 was used. Post-sorting, participants had the opportunity to add missed citizenship skills. In the group sorting activity, participants added additional citizenship skills. Following the principles of Q methodology, these additional skills are not included in the Q data analysis. The web-based analysis software Ken-Q Analysis, version 1.0.8 (Banasick, 2019) was used for the statistical analysis of both sorting activities. Following the statistical analysis procedure to extract factors, the verbal and annotated responses (available for the individual sorting activity) were used to enrich the interpretation of the extracted factors. Before presenting the factor descriptions (see Results section), more details about the statistical analysis of the data per sorting activity are provided.

Group sorting activity

The data from the three groups' sortings were entered into Ken-Q Analysis (Banasick, 2019). There are no strict rules regarding the number of required sortings to analyse in the Q methodology, yet the number of sortings (mostly the number of participants) should allow shared viewpoints to emerge (Watts & Stenner, 2005). Before the analysis, it is assumed that for this analysis no more than one-factor solution could be extracted from the data. This assumption is based on the amount of variance a single sort would have (33,33% in the group sorting activity) and that a two-factor solution would violate the standard accepted rule that a factor has at least two single Q sorts that load significantly on a factor (see Watts & Stenner, 2005, p.81).

The data was initially explored with the Ken-Q Analysis software by applying a principal component analysis and scree plot. This exploration confirmed the assumption that for the group sorting activity, there was only a one-factor solution. Following the analytical phases from Ken-Q Analysis, the two-factor solutions were further analysed by conducting a centroid factor analysis with Varimax rotations (see Table 2). The software allowed a two-factor analysis when the factor loadings were flagged as explaining the 'Majority of Common Variance'. As indicated above, there is the standard accepted rule to opt for a factor when a factor has 'two or more significantly loading Q sorts'. Another commonly accepted statistical rule is the Kaiser-Guttman criterion. A factor satisfies the Kaiser-Guttman criterion when the Eigenvalue of the factor is equal to or above 1.00 (Watts & Stenner, 2012, p.106). An Eigenvalue below 1.00 means that less than a single Q sort accounts for the factor variance (Watts & Stenner, 2005). Only factor 1 satisfies the Kaiser-Guttman criterion, with an Eigenvalue of 1.74.

The Q analyses of the group sorting activity confirmed the assumption that three sortings are not enough sortings to emerge (multiple) viewpoints. Table 4 presents the ranking of the statements for each factor, both for the group sorting and the individual sorting activity.

Table 2
Factor loadings group sorting activity.

	Factor 1	Factor 2
Group 1	**.56**	.50
Group 2	.45	.49
Group 3	**.62**	.59
Eigenvalue	1.74	.00
Explained Variance	58%	0%

*Note: Sorts indicated in **bold** are statistically significant loadings ≥ 0.05, in this study factor loadings of ≥ 0.57.*

Individual sorting activity

All students (*N*=14) participated in the evaluation session, yet 11 individual sortings are included in this analysis due to participants' active consent. For the analysis of the individual sorting activity, the same procedural steps were followed as for the group sorting activity. First, the data was explored via a principal component analysis and scree plot, using the Ken-Q Analysis software. Inspecting the slope of the scree plot indicates that the slope changes at principal component 3 (see Fig. 3). This means that a three-factor analysis would be the most comprehensive outcome. Secondly, the data was further analysed with a Centroid Factor Analysis and extracting options for a two-, three-, and four-factor solution for Varimax rotation were explored. After this exploration of multiple factor solutions, the three-factor solution was found the most comprehensive. Subsequently, this solution does not violate the two commenly accepted rules. Each factor has 'two or more significantly loading Q sorts' at the level of 0.05 (Watts & Stenner, 2005; calculation of significant factor loadings individual sorting activity = 1.96 * (1 ÷ $\sqrt{\text{number}}$ of items in Qset) = 1.96 * (1 ÷ $\sqrt{12}$) = ≈ .57) and the Kaiser-Guttman criterion (Eigenvalues ≥ 1.00) has been met with Eigenvalues of 3.52 (factor 1), 1.74 (factor 2) and 1.56 (factor 3). Table 3 presents the weighted average rankings of the statement for each factor, including additional background information from the participants.

Factor interpretations individual sorting

Factor interpretation factor 1: "Changing minds"

The shared perspective from the students defining the first factor is that they find it important that the skills to be taught within the ALE are focused on gaining the insights that "perspectives based on knowledge" and "opinions can change over time". The least important did these students find the skills that are also offered during other moments in the curriculum, such as "reason based on facts", "make decisions as a group" and "how to collaborate with others". In the evaluation session, one of the students defining this factor commented that "*it was refreshing to learn that new knowledge and information make it possible to gain new insight and perspective. Plus, that it is not wrong to adjust your opinion when you learned something new*".
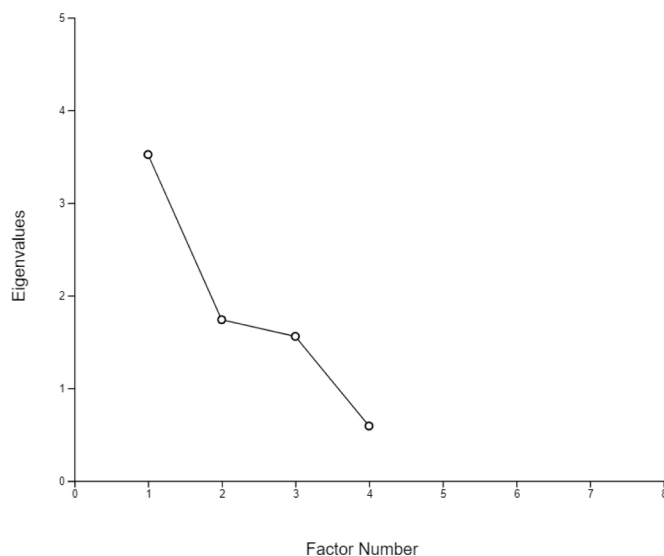

Fig. 3. Scree test of Principle Component Analysis, individual sorting activity.

Table 3
Factor loadings individual sorting activity.

Participant number	Study	ALE Group	Factor 1 $n = 4$	Factor 2 $n = 2$	Factor 3 $n = 2$
1	International Business	3	**.59**	−0.35	−0.17
2	Built Environment	3	**.77**	.08	−0.00
3	International Business	3	.18	−0.05	**−0.79**
4	Built Environment	3	.44	−0.07	−0.16
5	International Business	1	**.86**	.12	−0.11
6	International Business	1	−0.46	.27	.39
7	International Business	1	−0.03	−0.05	**1.00**
8	International Business	1	**1.00**	.03	−0.07
9	Textile Technology	2	−0.43	.44	.04
10	Textile Technology	2	−0.14	**−0.58**	.29
11	International Business	2	−0.01	**.85**	.23
Eigenvalue			3.52	1.74	1.56
Explained Variance			30%	13%	18%

Note: Sorts indicated in **bold** *are statistically significant loadings ≥ 0.05, in this study factor loadings of ≥ 0.57.*

Factor interpretation factor 2: 'Individual collaboration skills'

The overall essential skills to be taught in the ALE according to the students defining the second factor are skills related to "evaluating the reliability of information" and "reasoning based on facts". These students also valued the opportunity within the ALE to "collaborate" with others and learn how to "deal with resistance". Although collaboration is an essential skill according to these students, they find the skills to improve discussions and dialogues such as "giving space to other opinions", "reasoning and arguing with each other", and "thinking from different perspectives" not essential to the ALE. The following response illustrates the shared perspective of the students defining the second factor: "*because of the experience of working with others and real professionals in the field, I had the safe space within the ALE group to ask for support on how I should do things differently the next time*".

Factor interpretation factor 3: "group skills"

Contrary to the students from the first factor solution, the shared perspective of the third-factor solution is the essential skill to "collaborate with others" during the ALE. These students do share the perspective with the students from the first factor solution that within the ALE the skill that "opinions" and "insights" can change over time is taught. In addition, the students who define the third factor also find the skill to "make decisions as a group" very important. In line with the students defining the second factor, these students found the skills to "think from different perspectives", "think about what is desirable for the common good" and "reflect upon own assumptions" the least essential.

Discussion

Card sorting activities have been praised for their applicability in educational settings to facilitate discussions and reflections (Conrad et al., 2019; Hopkins, 2010; Lundberg et al., 2020). Yet, papers showcasing these practical applications in educational practices are limited. This paper aimed to fill this gap and illustrate the practical application of how card sorting activities can be used as a tool in higher education to capture group perspectives, prompt reflection and endorse citizenship skills such as discussion, critical thinking, group collaboration and decision-making. For this illustration, the methodological reflections and lessons learned from a case study will be presented below. Part of this case study was two different sorting activities, these were conducted by students at Saxion University of Applied Sciences, the Netherlands to capture the experiences and perceptions of students regarding citizenship education in ALE. The reflections and insights are supported and supplemented with literature from empirical studies which conducted card sorting activities in diverse educational settings, with a specific focus on Diamond Ranking and the sorting technique of Q methodology.

In the pilot study the conscious choice was made that in the first session, a group sorting activity was conducted instead of an individual sorting activity. The reasoning behind this choice was that to reach a consensus, about the placement of a statement, the students needed to start a dialogue and provide arguments, elucidating preferences with experiences to their fellow participants. All these skills were observed by the session leaders, including individual and group reflections on shared and individual experiences within the ALE. Students discussed together where to place a statement card if they had a different opinion over the prioritizing of the skill. The session leaders noted in their observations that the reflection and dialogue amongst the students during the group ranking activity was more student-centred compared to the Socratic dialogues in the second session. In this first session, the session leaders barely needed to provide guiding questions and stimulating prompts to keep the conversation going. In the Socratic conversation, the session leaders needed to provide frequent stimulation and new questions, to keep the dialogue going. One of the session leaders noted that the Socratic conversation felt like a dialogue between the session leader and the students, while with the card sorting activities the dialogue took place between the students. It appeared that the dialogue and discussion through the statements on the cards were more non-threatening than an

Table 4
Ranking of statements per factor.

	Group sorting "*During the ALE assignment, we learn:*"	Factor 1	Individual sorting "*For the ALE assignments, I find this skill essential:*"	Factor 1	Factor 2	Factor 3
Item*						
1.	to think from different perspectives.	2	think from different perspectives.	0	−2	−1
2.	to give space to other opinions.	0	give space to other opinions.	0	−1	0
3.	to reason and argue with each other.	0	reason and argue with each other.	−1	−1	0
4.	to reflect upon our assumptions.		reflect upon our assumptions.	0	0	−2
5.	to think about the reliability of the information.	0	think about the reliability of the information.	1	2	0
6.	to reason based on facts.	1	reason based on facts.	−1	1	−1
7.	to acknowledge that it is possible to change your opinion.	−1	acknowledge that it is possible to change your opinion.	1	0	1
8.	to acknowledge that insight can change over time.	−1	acknowledge that insight can change over time.	2	0	1
9.	to collaborate.	1	collaborate.	−2	1	2
10.	to make decisions as a group.	1	make decisions as a group.	−1	0	1
11.	to think about what is desirable for the common good.	−1	think about what is desirable for the common good.	1	−1	−1
12.	to deal with resistance.	0	deal with resistance.	0	1	0

open discussion (Mulder et al., 2019).

Students valued the activities they participated in for the pilot study. They expressed this during the third session and mentioned that with the sorting activities, both the group and individual sorting, they were stimulated to reflect and think on aspects that were normally not possible within higher education. They explained that during the ALE assignments, a tutor is there to help them complete the assignment for a client, while in the sessions from the pilot study time and space were created to use their critical thinking and reflection skills. This allowed them to see other aspects and dimensions and as such the bigger picture of the assignment.

The students also expressed that ranking the citizenship skills made them reflect on these skills on a different level. Some students elaborated that they were not aware that skills such as "approach a situation from different perspectives", "reflect about own prejudices" and "reflect about the common good" were skills that are taught in the ALE. Because of the ranking activities in the pilot study and the overall evaluation in the third session, the students became more verbal about what they thought needed to change in the curriculum to practice and develop some of the hidden curricula of the ALE and higher education. Not only prompted the ranking activities the students to reflect on the twelve citizenship skills concerning the curriculum, some students critically reflected more on individual skills and the assignments and products made in the ALE.

Lessons learned

As illustrated in this paper card sorting activities are suitable for diverse educational purposes in higher education. The card sorting activities prompted the students to apply several citizenship skills while reflecting on the citizenship curriculum of Saxion University of Applied Sciences. The sorting activity acted as a prompt and provided the opportunity to apply citizenship skills such as dialogue and discussion amongst students (Howard & Dhillon, 2021; Lo Bianco, 2015; Wolf, 2016). The discussion amongst the participants, during the group sorting activity, provided insights into their experiences with the ALE and perceptions of citizenship education. Interestingly, the card sorting activities led to more student-driven discussions, compared to the Socratic conversation. This suggests a strong educational value for group card sorting activities as an educational tool because it allows students to apply and practice citizenship skills themselves.

Additionally, both the group ranking and the individual sorting activities facilitated opportunities for the participants to think critically about the curriculum. An interesting reflection was that some aspects of the citizenship curriculum were unknown to the students. It could be stated that students would not have reflected or thought about the hidden curricula, in a traditional interview. Yet, because of the carefully selected set of citizenship skills, based on the citizenship literature, and the forced nature of the ranking activity to use all statements, students were compelled to reflect (Sklarwitz, 2017). Although students were unaware of some aspects of the curriculum, they did have an opinion about these specific statements. The sorting activity did raise their awareness about citizenship education and their development as future professionals with (ethical) responsibilities. These reflections are in line with Mulder et al. (2019) who used a sorting activity, based on the Q methodology, to have educators and program directors reflect on the hidden curriculum in the clinical workplace.

Traditionally, Q studies are conducted individually to study perceptions within a group of people (Rieber, 2020; Watss & Stenner, 2012). In the case study, a group sorting activity was conducted. This resulted in an activity of group collaboration, deliberation and finally group decision-making, all of which are seen as valuable citizenship skills (Guérin, 2018; ten Dam et al., 2010). The students explained their choices, making preferences more explicit. Revealing this kind of tacit preference, allows teachers and educational designers to further develop the curriculum to meet the preferences of students. Explaining a single

choice is not a result exclusively for group sorting activities. In individual sortings, this dialogue based on explaining sorting choices takes place between the participant and the researcher (Wolf, 2016). Based on this deliberation and dialogical features of the card sorting activities educators could use both the group and individual sorting activities, as deliberate educational tools, in their classroom practices. The card sorting activity, as presented in this paper, could be a solution to the request of educators to have practical tools to support and practice students' reflection and dialogical skills (Boyle & Jackson, 2009).

In the design of the pilot study, another traditional Q methodological feature was changed. Participants sorted the statements on a diamond-shaped grid instead of the traditional bell-shaped grid (horizontally orientated). This design choice was explicitly made to prevent confusion about the direction of the sorting scale (see Paragraph "Applied card sorting activities"). Within Q methodological papers, there appears to be a consensus about the shape and horizontal orientation of the sorting grid. Yet, in a recent Q study by Hellström and Lundberg (2020), the researchers choose to rotate the distribution grid by 90° with the argumentation that this would allow participants to sort the statements more instinctually (p.10). Watts and Stenner (2005, p.77) pointed out that based on the work of Brown (1980) the shape of the grid has "no noticeable contribution" to the factor solutions. The factor analysis of the current study and those from Hellström and Lundberg (2020) support this notion.

As mentioned in the introduction of this paper, the aim of this paper had a more practical implication. Because of that, the initial choice was made not to analyse the group sorting activity because the group-wise sorting ignores the underpinning of Q methodology to study the subjectivity or perspectives of individuals (Rieber, 2020). However, it is not impossible to apply Q analyses on group sortings to explore if there are differences between the groups. This type of shared group perspectives could be of interest when exploring microcultures within and between groups (see for example Mulder et al., 2019). In retrospect, the one-factor solution from the group sorting activity was not unforeseen. Although one-factor solutions are not uncommon in Q methodology (see for example Brown, 1980 and Moate et al., 2017), the number of group sortings discarded a common assumption within Q methodology. Researchers commonly justify using the Q methodology because the method allows for small sample sizes (Lundberg et al., 2020; Wolf, 2018). A rule of thumb is that a Q study requires half as many participants as there are Q statements (Rieber, 2020; Watts & Stenner, 2012). In the case of the group sorting activity, conducted in this study, this rule of thumb was violated. Watts and Stenner (2005) state that this rule of thumb should not be followed by the letter and that the number of sortings should be large enough to have shared viewpoints emerge from the data. This requires that a factor consists of at least two single Q sorts that load significantly on a factor (see Watts & Stenner, 2005, p.81).

Although the primary focus throughout this article is the higher education setting, card sorting activities are not limited to the participants' specific educational setting or age range (Conrad et al., 2019; Lundberg et al., 2020). One of the strengths of card sorting activities is that the materials to be sorted can be easily adjusted to each educational context and setting (Hopkins, 2010; Lundberg et al., 2020). The studies used in the theoretical background of this paper cover a wide variety of educational contexts, indicating the wide applicability of card sorting activities such as Diamond Ranking and the Q sorting technique. The practical application of card sorting activities as an educational tool, in specific the possibilities of the Q sorting technique, should be considered to have wider applicability than higher education and be of interest to academics and teachers in general. Hence, the study and application of card sorting activities as an educational tool should not be limited to only the higher education setting. When the card sorting activity is applied for educational purposes, such as the facilitation of dialogues and reflection, conducting analyses such as factor analyses or descriptive analyses can be deemed as less important and too technical for teachers without an academic background.

In light of this notion of academic background, it is of interest to mention that not all educators who work at a University of Applied Sciences (UAS) have an academic background. In the Netherlands, students can obtain their bachelor's degree via two routes: at a university of applied sciences or at an academic university. Both bachelor diplomas are of the same value (Government of the Netherlands, n.d.). UAS are also present in other European countries under synonyms such as 'University College', 'polytechnics' and *'Technische* or *Fachhochschule'* (uas4europe, 2022). At these UAS institutes, the focus lies on delivering applied and practice-orientated education for bachelor's degrees with an explicit professional orientation. Typically, UAS educators have worked in a professional orientation and provide theoretical and practical training to students (uas4europe, 2022). These educators are likely interested in card sorting activities as an educational tool, yet it is unlikely that these educators are interested in conducting the analytical aspects of Q methodology. Consequently, not analysing completed sortings would ignore the underpinning of Q methodology to study the subjectivity or perspectives of individuals (Rieber, 2020) and support the prejudice of Q methodologists that only conducting a sorting activity, without Q analyses, leaves possibilities untouched (Wolf, 2016). To prevent this scenario, collaborations between teachers and Q methodologists are encouraged. Via this collaboration, the potential and mechanisms of card sorting activities as an educational tool, in general, can be further explored.

The case study, used to illustrate the applicability of card sorting activities, was part of a pilot study in which the card sorting activities were used to prompt students to reflect on the curriculum and to what extent citizenship education is taught and facilitated in ALE in higher education settings. Due to the small scale of the pilot study, some questions remain unaddressed which future research could explore. Future research should for example assess if citizenship skills from students increase when card sorting activities are used as an educational tool specifically to practice skills such as deliberating and critical thinking. Future research should also explore if there are different underlying mechanisms for the group and individual card sorting activities. Concurrently, a larger-scale study could examine if and how Q analysis could further help explore shared and opposite classroom perspectives in general and about citizenship education in specific.

Final thoughts

The impetus for this paper stems from the lack of empirical evidence illustrating the application of card sorting activities in higher education settings, which showcases the value of card sorting activities in higher education. Based on the reflections presented above, supported by literature about card sorting activities, this paper illustrates that card sorting activities could be used for diverse educational purposes, such as evaluation, and assessment, prompting students to critically reflect and practice citizenship skills such as deliberation, group discussions and group decision-making. Hopefully, this paper created the start of an evidence-based foundation to apply and study card sorting activities, based on the Q sorting technique, in educational practices such as higher education.

This paper ends with two invitations. The first invitation is for educators to add card sorting techniques to their teaching toolkits and experiment with individual and group ranking activities in their teaching practices. The second invitation is for researchers to collaborate with these educators and publish about the teaching practices in which card sorting activities are used. In doing so, more empirical evidence will be added to the body of literature and evidence on card sorting activities as an educational tool.

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References

Banasick, S. (2019). *Ken-Q Analysis* (Version 1.0.8) [Software]. Available from https://shawnbanasick.github.io/ken-q-analysis/doi:10.5281/zenodo.1300201.

Biesta, G.J.J. (2020). *Burgerschapsvorming: Pedagogische en levensbeschouwelijke eigenheid op het democratisch speelveld* [Citizenship education: Pedagogical and ideological individuality on the democratic playground; White paper]. Verus, vereniging voor katholiek en christelijk onderwijs. Retrieved February 2021, https://www.verus.nl/aanbod/producten/whitepaper-gert-biesta-pedagogische-en-levensbeschouwelijke-eigenheid-op-het.

Boyle, M., & Jackson, P. (2009). Using card sorts. *Physical Sciences Centre-Briefing Paper, 1.*

Clark, J. (2012). Using diamond ranking as visual cues to engage young people in the research process. *Qualitative Research Journal, 12*(2), 222–237. https://doi.org/10.1108/14439881211248365

Conrad, L. Y., Demasson, A., Gorichanaz, T., & VanScoy, A. (2019). Exploring card sort methods: Interaction and implementation for research, education, and practice. *Proceedings of the Association for Information Science and Technology, 56*(1), 525–528. https://doi.org/10.1002/pra2.81

de Leeuw, R. R., de Boer, A. A., Beckmann, E. J., van Exel, J., & Minnaert, A. E. M. G. (2019). Young children's perspectives on resolving social exclusion within inclusive classrooms. *International Journal of Educational Research, 98*, 324–335. https://doi.org/10.1016/j.ijer.2019.09.009

De Ruyter, D., & Schinkel, A. (2017). Ethics education at the university: From teaching an ethics module to education for the good life. *Bordón. Revista de pedagogía, 69*(4), 125–138. https://doi.org/10.13042/Bordon.2017.690409

Duncan, N., & Owens, L. (2011). Bullying, social power and heteronormativity: Girls' constructions of popularity. *Children & Society, 25*(4), 306–316. https://doi.org/10.1111/j.1099-0860.2011.00378.x

Fincher, S., & Tenenberg, J. (2005). Making sense of card sorting data. *Expert Systems, 22*(3), 89–93.

Government of the Netherlands. (n.d.) Tertiary (higher) education (n.d.) Government of the Netherlands, Retrieved November 27, from https://www.government.nl/topics/secondary-vocational-education-mbo-and-tertiary-higher-education/tertiary-higher-education.

Guérin, L. J. F. (2018). *Group problem solving as citizenship education: Mainstream idea of participation revisited.* Saxion Progressive Education University Press.

Hellström, L., & Lundberg, A. (2020). Understanding bullying from young people's perspectives: An exploratory study. *Educational Research, 62*(4), 414–433. https://doi.org/10.1080/00131881.2020.1821388

Herrington, A., Herrington, J., & Herrington, J. (2014). What is an authentic learning environment? In T. C. Reeves, & R. Oliver (Eds.), *Handbook of research on educational communications and technology* (pp. 401–412). Springer.

Hobby, R. (2004). *A culture for learning: An investigation into the values and beliefs associated with effective schools.* Hay Group Education. Retrieved December 15, 2021.

Hopkins, E. (2010). Classroom conditions for effective learning: Hearing the voice of Key Stage 3 pupils. *Improving Schools, 13*(1), 39–53. https://doi.org/10.1177/1365480209357297

Howard, C., & Dhillon, J. K. (2021). Q-sort as a tool for promoting outstanding leadership. *Practice.* https://doi.org/10.1080/25783858.2021.1882264

Jeliazkova, M. I. (2015). *Citizenship education: Social science teachers' views in three European countries.* University of Twente [Unpublished doctoral dissertation].

Lo Bianco, J. (2015). Exploring language problems through Q sorting. In F. M. Hult, & D. C. Johnson (Eds.), *Research methods in language policy and planning: A practical guide* (pp. 69–80). Wiley–Blackwell.

Lundberg, A., de Leeuw, R. R., & Aliani, R. (2020). Using Q methodology: Sorting out subjectivity in educational research. *Educational Research Review, 31*, Article 100361. https://doi.org/10.1016/j.edurev.2020.100361

Moate, R. M., Cox, J. A., Brown, S. R., & West, E. M. (2017). Perceptions of helpfulness of teachers in didactic courses. *Counselor Education and Supervision, 56*(4), 242–258. https://doi-org.saxion.idm.oclc.org/10.1002/ceas.12083.

Mulder, H., Ter Braak, E., Chen, H. C., & Ten Cate, O. (2019). Addressing the hidden curriculum in the clinical workplace: A practical tool for trainees and faculty. *Medical Teacher, 41*(1), 36–43. https://doi.org/10.1080/0142159X.2018.1436760

Niemi, R., Kumpulainen, K., & Lipponen, L. (2015). Pupils as active participants: Diamond ranking as a tool to investigate pupils' experiences of classroom practices. *European Educational Research Journal, 14*(2), 138–150. https://doi.org/10.1177/1474904115571797

Owens, L., & Duncan, N. (2009). They might not like you but everyone knows you": Popularity among teenage girls. *Journal of Software, 3*, 14–39. https://doi.org/10.21913/JSW.v3i1.408

Ramlo, S. (2015). Student views about a flipped physics course: A tool for program evaluation and improvement. *Research in the Schools, 22*(1), 44–59.

Rieber, L. P. (2020). Q methodology in learning, design, and technology: An introduction. *Educational Technology Research and Development, 68*(5), 2529–2549. https://doi.org/10.1007/s11423-020-09777-2

Rimm-Kaufman, S. E., Storm, M. D., Sawyer, B. E., Pianta, R. C., & LaParo, K. M. (2006). The teacher belief Q-sort: A measure of teachers' priorities in relation to disciplinary practices, teaching practices, and beliefs about children. *Journal of School Psychology, 44*(2), 141–165. https://doi.org/10.1016/j.jsp.2006.01.003

Rockett, M., & Percival, S. (2002). *Thinking for learning.* Network Educational Press.

Sayeski, K. L., & Higgins, K. (2014). Redesigning special education teacher preparation programs with a focus on outcomes. *Teacher Education and Special Education, 37*(2), 91–105. https://doi.org/10.1177/2F0888406413513274

Schuitema, J., Dam, G. T., & Veugelers, W. (2008). Teaching strategies for moral education: A review. *Journal of curriculum studies, 40*(1), 69–89. https://doi.org/10.1080/00220270701294210

Sklarwitz, S. (2017). Assessing Global Citizenship Attitudes with Q Methodology. *The Journal of Social Studies Research, 41*, 171–182. https://doi.org/10.1016/j.jssr.2016.09.001

Stephenson, W. (1935). Technique of factor analysis. *Nature, 136*, 297.

Ten Dam, G., Geijsel, F., Reumerman, R., & Ledoux, G. (2010). Burgerschapscompetenties: De ontwikkeling van een meetinstrument [Citizenship competences: The development of an instrument]. *Pedagogische studiën, 87*(5), 313–333.

Uas4europe (2022). *What are UAS?* Uas4europe.eu Retrieved November 27, 2022, from https://uas4europe.eu/ua-what/what-are-uas/.

Van der Ploeg, P., & Guérin, L. (2018). Burgerschapsvorming, maar dan anders [Citizenship education in an alternative way]. *Van twaalf tot achttien*.

Van Stekelenburg, L. H., De Ruyter, D., & Sanderse, W. (2021). Equipping students with an ethical compass.' What does it mean, and what does it imply? *Ethics and Education, 16*(1), 91–107.

Watts, S., & Stenner, P. (2005). Doing Q methodology: Theory, method and interpretation. *Qualitative Research in Psychology, 2*(1), 67–91. https://doi.org/10.1191/1478088705qp022oa

Watts, S., & Stenner, P. (2012). *Doing q methodological research: Theory, method and interpretation.* SAGE Publications.

Wolf, A. (2016). Between-case dialogue: Public engagement in the second-person voice. *Journal of Environmental Studies and Sciences, 6*(3), 609–616. https://doi.org/10.1007/s13412-015-0296-y

Wolf, A. (2018). *Why Q? Attending to Q Methodology as Methodology* [paper presentation]. In *34th Annual Meeting of the International Society for the Scientific Study of Subjectivity*.

Wolf, A. (2022). Perspectives on Q sorting. In J. C. Rhoads, D. B. Thomas, & S. E. Ramlo (Eds.), *Cultivating Q methodology: Essays honoring Steven R. Brown* (pp. 242–268). International Society for the Scientific Study of Subjectivity.