

Reaching the Sustainable Development Goals; a case study on how to improve the triple helix model for the Municipality of Rheden

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ABSTRACT

In 2019, the Municipality of Rheden was awarded the title of ‘Most promising Global Goals Municipality’ of the Netherlands. It is well on its way to implement the United Nation’s Sustainable Development Goals. One way in which the municipality is working towards these goals is by using the triple helix model. The triple helix model is a cooperation model that unites industry, educational institutes, and government into a cooperation model. The municipality is already working extensively with this model, but it needs improvement. Within this case study, research has been done on how to improve the triple helix model for the Municipality of Rheden. Multiple different people from all three different partners, were interviewed and asked about their experiences and ideas regarding the triple helix model. After a thematic analysis, it was concluded there are three main factors that contribute to the quality of the triple helix model. Those being the creation of a network, the management of expectations and commitment. The network allows for easier, and shorten lines of, communication. The management of expectations allows for less disappointment and less problems. And commitment ensures that projects are followed through and new ideas are executed. Finally, suggestions for further research are made. Further research should mainly focus on different cases, with different municipalities and a different level of triple helix cooperation.

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Keywords

Triple Helix; SDG, cooperation, municipality, entrepreneur, education, Rheden

1. INTRODUCTION

1.1 Background

In 2018, the municipality of Rheden was awarded the title of ‘Most promising Global Goal municipality of the Netherlands’. From the 14th of May, 2018, the municipality started the realization of their new organizational model. This model is based on five clusters, which are in turn based on the United Nation’s Sustainable Development Goals (SDGs). One year later, the municipality was awarded the ‘Most inspiring Global Goals municipality’ of the Netherlands (Klomborg, 2019).

The SDGs are a set of 17 goals that provide a blueprint on how to reach peace and prosperity for people and the planet, now and in the future. The goal is to reach all SDGs by 2030 (United Nations, sd). The SDGs have to protect the planet, end poverty and ensure prosperity to achieve a sustainable development agenda (George, Howard-Grenville, Joshi, & Tihanyi, 2016). Examples of these SDGs are ‘No poverty’, ‘Zero hunger’, ‘Gender equality’ and ‘Climate action’ (United Nations, sd).

Even though the United Nations (UN) uses a set of 17 SDGs, the Municipality of Rheden uses 18 goals. At a triple helix challenge initiated by the municipality, students were given the opportunity to come up with an 18th SDG. At which point SDG 18: ‘Share and Pass On’ was introduced (Rheden 4 Global Goals, 2018). These are only some of the ways in which the municipality is trying to become even more durable and sustainable. For improving external impact towards inhabitants, entrepreneurs, and educational organizations the municipality advocates the principles of a challenge-based approach. The municipality works from five clusters of SDGs and plans and budgets are allocated to each of these five clusters. These clusters are: Welfare, Sustainability, Economic development, Spatial development and Governance and Safety (Klomborg, 2019). Each of these policy team clusters is focused on a number of SDGs that are related to their perspective, these clusters can be found in Table 1.

Table 1. Clusters of policy teams, with their Global Goals, within the Municipality of Rheden.

Cluster	Global goals			
Welfare	1: No poverty	2: Zero hunger	3: Good health and well-being	6: Clean water and sanitation
Sustainability	7: Affordable and clean energy	12: Responsible consumption and production	13: Climate action	
Economic development	4: Quality education	8: Decent work and economic growth	9: Industry, innovation, and infrastructure	10: Reduced inequalities
Spatial development	11: Sustainable cities and communities	14: Life below water	15: Life on land	
Governance and Safety	5: Gender equality	16: Peace, justice, and strong institutions	17: Partnerships for the goals	18: Share and pass on

Another way of improving the external impact of the municipality, is the usage of the triple helix-model (Klomborg, 2019). The triple helix-model is a model for collaboration and cooperation between educational facilities, businesses and government (Akberdina & Malyshev, 2011). The triple-helix combines and integrates the interests of the three partners and should, ideally, lead to an increased level of cooperation between the three (Benner & Sandström, 2000). The triple helix model is already being used extensively within the municipality, but the general consensus within the municipality is that improvement is needed.

As noted before, the municipality is already working with a triple helix model. One of the items in their program budget for 2020 is the further development of their local triple helix project called ‘VeluwevOOOm’ (Gemeente Rheden, 2019). VeluwevOOOm is a cooperation between associations of entrepreneurs, educational facilities, and the municipality. They are working together on projects with their own dynamic and approach, that fit the scale of the municipality of Rheden (VeluwevOOOm, 2020). Projects within the VeluwevOOOm include the creation of an Astrum Global Goal Pop-Up Store, that sells used products a second time (Nieuws.nl Rheden, 2019). Another project within this triple helix is the ‘VeluwevOOOm got Talent’ project. Which is a project wherein young students get the chance to start their own socially entrepreneurial project or own start-up (VeluwevOOOm, sd).

Further triple helix projects already started within the municipality of Rheden are: the cooperation between the municipality and Van Hall Larenstein, a University of Applied Sciences in Velp, to create a SDG demonstrator (Rheden 4 Global Goals, 2018) and the cooperation between the municipality and the Astrum College, similar to a community college, that created the ‘Hackathon’. Which is an event during which students had to tackle a societal problem within one day (Astrum College, sd).

In their 2018 annual report, the municipality stated that the triple helix model “...leads to a more jointly approach to local issues, like the fight against poverty, the care of elderly, neighbourhood furnishings, climate-approach and energy transition” (Klomborg, 2019). The triple helix model is already being used extensively within the municipality, but the practical question on how this cooperation can be improved rose.

1.2 Relevance

A lot of literature has been written about the triple helix model throughout the last decades (Etzkowitz & Leyesdorff, 2000; Carayannis & Campbell, 2009; Triple Helix Association, 2020). Yet, regarding certain areas, less research has been done. In most cases of the triple helix model in practice, the governmental institute is the national government. There are only a few papers that apply the triple helix model at a local government, like a municipality-level, which are Rodrigues & Melo (2012) and Larsen & Corneliussen (2016). Nevertheless, the former solely focus on solving a crisis with the triple helix model, and the latter focus on multiple municipalities that work in cooperation.

Furthermore, research on how the triple helix model contributes towards the achievement of the SDGs is scarce. Lahi (2019) has researched this, but only for the country of Albania. Which, since it is an entire country, already has a different way of working towards these goals than a medium-sized municipality like Rheden. Finally, the challenges that are mentioned by Ruuska & Teigland (2009) were concluded from a study from one partnership that involved 16 organizations. My research will show whether these challenges also occur in a triple helix model at a more local level and whether different challenges will occur.

My research also builds on other articles regarding the triple helix and the SDGs (e.g. Lahi, 2019). Ruuska & Teigland (2009) propose that further research should focus on comparing public-private partnership with partnering with cross-cooperation in detail. Which is what my research will focus on, being the partnership that arises with the triple helix model. Biermann, Kanie, & Kim (2017) argue that academic support for the integration of the social, economic, and environmental dimensions of the SDGs is critical. They suggest that further research should be done into the integration of SDGs into different agendas and rationales. Implementation of SDGs is a complex challenge, yet with empowering and engaging affected partners, solutions can be created (Kuenkel, 2019). Which is not only what the municipality of Rheden is already doing, by using the clusters of SDGs, but could also focus on how the SDGs can be integrated in a model of cooperation, like the Triple Helix, similar to Le Blanc (2015).

According to George et al. (2016), in order to work on articulating and participating in Grand Challenges, like the SDGs, representative empirical questions would be “What factors promote voice and engagement in multilateral dialogues among organizations, societies, and their stakeholders? When is it most effective?”, which is what the research question of this paper focuses on, as the factors that promote voice and engagement in multilateral dialogues are similar to the factors that influence the quality of the triple helix model.

For a special issue of the triple helix journal, put together by the triple helix association, multiple paper topics to be addressed were mentioned. One of these topics is: “How different is studying university-industry-government relations in various regional, institutional, economic, cultural and other contextual settings.” (Triple Helix Association, 2020), which is very much in line with this research, as this research focuses on the triple helix model in the municipality of Rheden.

The practical relevance of this research is to find out how the triple helix model can be improved for the municipality of Rheden. With the results of this research, an insight into the cooperation within the triple helix model will be gained. This will allow the municipality of Rheden, and other organizations, to create a development plan in order to improve the triple helix cooperation in practice.

1.3 Research objective and research question

As has been mentioned earlier, the objective of this research is to find out how the triple helix model can be improved for the municipality of Rheden. Yet, in order to find out how this model can be improved, the factors that determine the quality of the model must be identified. As a result, the objective of this research is to determine what factors contribute to the quality of the triple helix model. The research question for this study therefore is:

“What factors contribute to the quality of the cooperation between entrepreneurs, educational institutes and local government (triple helix model) of a medium-sized municipality that collaborate on UN SDG-driven projects?”

1.4 Structure

The structure of this paper is as follows. First, a theoretical framework is laid out, in which the triple helix model is discussed and explained. After which, challenges and enablers of the model are explained, and further examples of the triple helix model are shown. Secondly, the methodology of the research is presented. At which point, the research procedure will be explained in more detail. After which, the results of the research will be laid out. This is followed by a discussion and a conclusion, at which point advice will be given on how to improve the triple helix model and suggestions for further research will be noted.

2. THEORETICAL FRAMEWORK

The triple helix model can be summarized as a model of cooperation between educational organizations (like universities), industry and government (Leydesdorff & Etzkowitz, 1996). Within the triple helix model, each partner can perform different roles. Dzisah & Etzkowitz (2008) argue that the role of government involves delegating decision making to collaborations with regional authorities and other actors. They argue that industry should engage in innovation and transfer these innovations. Universities, or other educational institutes, play an innovative role in society and should focus on translational research and community development.

2.1 Triple helix usages

In practice, the triple helix model can be used in different ways. It could be used a central reference in problem-solving. Since it combines views from three different perspectives, and it uses three different partners in a solution from the start. At which point the three partners try to find solutions using their combined resources and ideas. Here, the triple helix is used as a starting point for problem-solving (Rodrigues & Melo, 2012).

The triple helix model can also be used as the starting point for collaboration (Yoda & Kuwashima, in press). Furthermore, a project in Finland, a university and a technology company combined their intellectual leadership with the city’s political leadership in order to get a successful project as a result (Ojala, Orajärvi, Puhakka, Heikkinen, & Heikka, 2011).

The triple helix model is also used as a starting point for analysis, from which is shown that a multi-stakeholder network is a vital driving force in completing a project (Larsen & Corneliusen, 2016). Which shows that the triple helix can also be used as a driving force behind a project.

2.2 Triple helix configurations

According to Etzkowitz & Leydesdorff (2000), there are three different triple helix configurations: Triple helix I is the configuration in which the government, covers and controls both the academia and industry, thus the university and industry. In this situation, which is no longer common in the world, the government also directs the relation between the university and industry. The most dominant version of this configuration could be found in the former Soviet Union, where it shared a resemblance with “existing socialism”. In Triple helix II, a “laissez-faire” model, the three institutions are all clearly separated and have no overlap. With this configuration, the relations between the different institutions are clearly defined. The third, and final, configuration, Triple helix III, can be seen as generate knowledge infrastructure, with overlapping institutional spheres.

In this configuration, each institution takes part of the role of another, resulting in a hybrid cooperation (Etzkowitz & Leyesdorff, 2000).

Examples of this hybrid cooperation could be business centres inside universities or strategic alliances between companies and universities (Leyesdorff & Etzkowitz, 1996), like the University of Twente, which cooperates in research with BP and has partners in the European Commission's Clean Sky project (Examples of collaboration, n.d.). In figure 1, a visual representation of the Triple helix III configuration can be found.

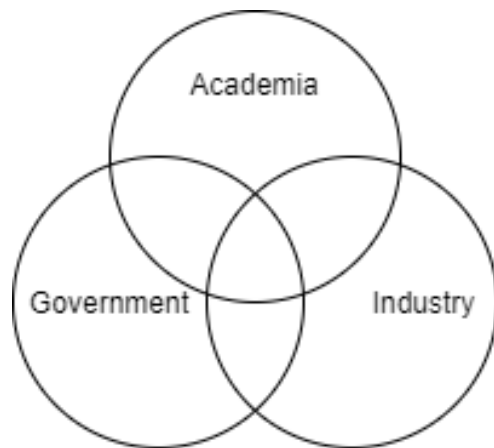


Figure 1. Visualization of the Triple helix III configuration.

For most countries and regions, the Triple helix III is the form of cooperation that is most desirable to achieve, for instance when it is the objective to create an innovative environment that consists of university spin-off firms (Etzkowitz & Leyesdorff, 2000). But not only spin-off firms are examples of successful Triple helix III results, on the long term, existing firms can also benefit from university-industry collaboration (Shi, Wu, & Dahai, 2020).

2.3 Triple helix additions

As the name suggests, the triple helix generally unites three dimensions of collaboration partners. In Japan, however, a fourth dimension has been added to improve the design of the model: a dimension of internationalization (Leyesdorff & Sun, 2009). Reasoning behind the inclusion of this dimension is the increased cooperation with international colleagues. And even though a multinational perspective is likely to result in a focus towards internationalization, it might therefore lack industrial relevance. For the triple helix model, in order to incorporate the possibility of an international focus or a more localized focus, a fourth dimension was added, which is local-global (Leyesdorff, 2012).

Yet Carayannis & Campbell (2009) argue for a different 'Quadruple Helix' which adds a different fourth dimension: the media-based and culture-based public, in which the public refers to the people that are impacted by the proposed innovation or cooperation. This fourth helix is used to explain how potential cooperation, or innovation, is affected by culture and how they are communicated by the media, as both are capable of having a significant impact on the cooperation. Later, Carayannis & Campbell (2010) introduced the 'Quintuple Helix'. The Quintuple Helix uses all four of their aforementioned dimensions but adds a fifth one. The fifth helix is the "environment". With this helix, features of social ecology have been included.

2.4 Triple helix examples

A very local case study, in Águeda, Portugal, demonstrates the added value of the triple helix. Águeda uses the triple helix model as a central reference making in the policy-making process. In the official discourse, it is portrayed as crucial an instrument in order to promote sustainable development. Achievements of this approach were the establishment of an EU funded cooperation network that aimed at nurturing firm's innovative and competitive capacity. This network was the starting point for further cooperation between the local government, a local university and two major private organizations. And after combining efforts between all three groups, six projects were generated, all of which benefitted from the triple helix configuration. (Rodrigues & Melo, 2012).

Another example of a, quite successful, triple helix model is the 'Kennispark Twente' (Regio Twente, sd). Within this environment, investments are made to create a start-up climate to promote and support starting entrepreneurs. Which is similar to other University-cities in the Netherlands, such as Wageningen and Delft (De Wit, 2016).

The most well-known triple helix model within the municipality of Rheden is 'VeluwezOOOm'. Where, as mentioned earlier, projects like 'VeluwezOOOm got talent' and the 'Astrum Global Goal Pop-up Store' got realized through this triple helix. But also, the 'Cycling lane of the future' is being realized with usage of the triple helix partners. With which project the most innovative and secure cycling lane is being created (Redactie, 2019). Due to the extensive cooperation, the triple helix configuration in Rheden can be seen as Triple helix III

2.5 Triple helix challenges

As with every type of collaboration, there are challenges. One of the challenges the triple helix could have is the high potential of conflict. According to the analysis of Ruuska & Teigland (2009) there are numerous potential triggers for conflict: On a strategic level, conflict is mostly caused by different strategies or expectations of the partners. The biggest issue that arose were the different strategies or expectations of partners. When partners have different strategies or expectations, it is much more difficult to work together towards a common strategy or shared expectation. Managing expectations of others is essential, to achieve beneficial outcomes (Pletzer et al., 2018)

The ability to contribute the necessary resources that are required to complete a project can also lead to challenges (Engwall & Jerbant, 2009). Which is especially the case when one group has to put in substantially more resources into a project than another. These resources include intangible, like time, as well as tangible, such as equipment or money. Finally, the final challenge described is the interdependence of tasks. Especially when a process is linear, it can occur that one of the partners has to wait on another, which could lead to conflict (Ruuska & Teigland, 2009).

2.6 Triple helix enablers

Ruuska & Teigland (2009) also propose solutions to the aforementioned challenges. In order to have a successful project, it is of high importance that a clear project charter is created. In which the goals and visions of the projects are made clear, so that there are no discussions over this during the project. The recruiting of a project leader is also of increased importance. A project leader with knowledge of all dimensions of the triple helix model and negotiating skills is desired, this will allow the leader to negotiate between the different partners so that all participants can be satisfied.

The project leader also functions as bridge-maker between the different partners and was there to ensure a peaceful cooperation. The project leader can also help with managing expectations of a project. Since people tend to cooperate more when they expect their partner to cooperate (Pletzer et al, 2018). So clear expectations can lead to increased cooperation.

Ensuring open communication is also of major importance (Nijhuis, Vrijhoef, & Kessels, 2018). As this will allow all participants to be involved in all parts of the projects, so that all participants can assist if necessary. In table 2, an overview of the challenges and enablers be found.

Table 2: Triple helix challenges and enablers

Challenges	Enablers
Different goals	Create a project charter
Different expectations	Project leader
Input of resources	Open communication
Interdependence of tasks	Shared expectations

2.7 Road to SDGs

The triple helix model can be used in a way to work towards the achievement of the SDGs. According to George et al. (2016) management scholars have a unique position to address grand challenges, like the SDGs. Yet, in general, scholars do not have the resources or capabilities to address grand challenges on their own. The triple helix model could be the solution. As it allows the scholars to work with partners that do have the capabilities or resources needed.

As learned from the Millennium Development Goals, collective global actions should also involve a more active private sector and academia, next to the government (Lahi, 2019). Which is in line with the triple helix model. And, as Lahi (2019) mentions, the triple helix model enables broad, long-term cross-sector analyses of the impacts of innovative policies, research, and implementations.

Within a cooperation, partnership, or in an society, reducing blockages to interaction increases the movement within, and across, different institutional spheres, which clears the path to sustainable development, and thus the SDGs (Dzisah & Etkowitz, 2008).

3. METHODOLOGY

3.1 Research design

For this research, a qualitative research method is used. A qualitative research method is preferred over a quantitative research method, since it prioritized the depth and quality of the data over volume (Anyan, 2013). In this case, the quality and depth of the data is more useful than the amount of data. Since the objective is to improve the triple helix in a very specific situation, with limited actors. The fact that the amount of data is not as important as the quality of data is also suggested by De Massis & Kammerlander (2020).

According to Creswell, Hanson, Clark Plano & Morales (2007), there are five types of qualitative research designs. They describe a descriptive and in-depth question, as a question that develops an in-depth understanding about how different cases can provide an insight into a case of an issue. Seeing as the research question of this paper is quite similar, since it uses different cases, multiple participants in the research, to gain an insight into a case, the triple helix model in the Municipality of Rheden. The qualitative research design that is used in such a case is a case study. In this case, a single case study is used.

A single case study is used when a case is unusual from other cases (Yin, 2017). And since the Municipality of Rheden is a lot further in triple helix cooperation, and cooperation towards the SDGs, it is different from other municipalities.

3.2 Data collection

Data collection was done via interviews. There are multiple different available data collection methods within a case study, such as observations, interviews, audio-visual material, reports of documents (Creswell, Hanson, Clark Plano, & Morales, 2007). When executed well, interviews can provide a rich set of data (Qu & Dumay, 2011). Qu & Dumay (2011) also propose three different ways of interviewing, the structured interview, in which an interview guide is made and strictly followed, an unstructured interview, in which the interview is shaped the situation of an individual. The final form, the one used in this research, is the semi-structured interview, which is often regarded as one of the most effective means of gathering information (Kvale & Brinkman, 2009). This way of interviewing uses prepared questioning but is designed to draw out elaborate responses, therefore an interview guide was created. The guide is used to make sure the same approach is applied to the interview. This interview style allows people to answer with their own words and gives them the freedom to elaborate (Qu & Dumay, 2011), which turned out to be very insightful. For this research, an interview guide was made based on the theoretical framework of this paper. Within the guide, some questions are general, and some are based, specifically on literature. This guide can be found in Appendix A.

Since the objective of this research is to improve the triple helix, the choice was made to focus on people from the three circles that are already active within the triple helix, thus ensuring motivated people that have knowledge about what the triple helix is, and what it does. Upon the start of this research, a discussion has held with a contact-person within the municipality on who to interview and who to contact. At which point a list was created. This list did not only contain partners that were active and excited about the triple helix, but also critical partners that might have a limited role or might not see the benefit of investing time in the triple helix.

Out of the available options, a diverse range of involved individuals were selected. The choice was made to ensure that different participants from the same circle, for example schools, would not be related, thus all be from different schools. Initial contact to schedule the interviews was done via the municipality, an email was sent to the selected people, informing them about this research and informing them that they will be contacted. Upon completing the list from the municipality, a few other people were sought out and asked whether they wanted to participate. The choice of who to interview was not made by the municipality, which allowed for a group of participants that was clear of bias.

In general, the process of data collection was relatively easy. Due to the Corona-crisis, interviews were done via video-meetings or phone calls, but that was more often a benefit rather than a limitation, as it allowed for more interviews on the same day. In general, people were also excited to participate, which allowed for open conversation. Interviews were conducted in Dutch, to ensure that the participants could speak as open as possible. The answers were later translated to English.

With regards to scheduling interviews, the difficulty increased. Within the education and industry circle, interviews were scheduled and executed rather swiftly. Resulting in five participants from the education circle, and six participants from the industry.

Yet, scheduling interviews with individuals within the municipality was harder. Not only because responses came in slower than with the other circles, but also because the people that work within, or have sufficient knowledge of the triple helix, are all extremely busy, allowing for a long waiting time to schedule an interview.

From the municipality circle, four different participants were involved in this research. Even though, the number of respondents per partner is not as high as wished, it did result in a clear view from each of the partners.

Furthermore, it is not only argued that the number of responses is less relevant than the quality of the responses (De Massis & Kammerlander, 2020), but Gerring (2017) argues that if responses are relatively homogeneous, the inclusion of additional cases is unlikely to compromise the results. In an ideal situation, more responses from each of the partners would be included, but due to the time limitation, that has proven to be difficult.

3.3 Data analysis

In analysing the data, a thematic analysis was performed. A thematic analysis allows a researcher to see and makes sense of collective meanings and experiences, as it offers insides into patterns of meanings, themes, across a data set. With thematic analysis, the focus can be on analyzing across the entire data set, or one specific aspect in depth (Braun & Clarke, 2012). Within this paper, the results will first be analysed per question, and differences between the three partners will be discussed and related to literature. During, and after, this analysis, the most common themes will be used to come to a conclusion on what factors have an influence on the quality of the triple helix cooperation. With which information a recommendation can, be made for the municipality on how to improve the triple helix model.

4. RESULTS

The results in this chapter are ordered by the aforementioned interview guide. Within this chapter, results will be presented per partner of the triple helix. A general answer per group will be formed and an indication of the homogeneity of the answers of these partners will be given as well. Since, when the homogeneity within a group is high, it would make sense to streamline individual opinions to group opinions (Swanborn, 2010).

The very first question was an introductory question, wherein the participants of the research were asked to introduce themselves and shortly describe their role within the triple helix. This question was used to give an insight in the way a participant was involved in the triple helix model and was meant as more of an introductory question. In order to protect the privacy of the participants of this research, the answers to this question will not be included in this chapter.

Regarding the experiences with the triple helix, the responses differed. And as mentioned earlier, some partners were still critical. Starting with the experiences of the education circle. In general, the responses were quite homogenic. The general consensus is that the triple helix is beneficial, yet there is much more benefit to gain. Finally, the fact that commitment is occasionally missing was heard. Which could be regarding putting in hours to work on a project or just responding quickly and adequately. The participants of the industry circle were also asked about their experience. The experience of this group had quite a high level of homogeneity. According to the majority of the participants from this circle, the triple helix started off better than where it is at now, yet the general experiences were positive for most, but there is more benefit to be held. About half of the

entrepreneurs mentioned that the government, in this case the municipality, is the first one to stop, and that the municipality can be quite hard to keep going, not only because the lack of manpower, but also because of the lack of flexibility. Finally, regarding the governmental part of the triple helix, in this case the municipality, the responses were certainly homogenic. The municipality is fairly positive about the triple helix. There is a lot of positive energy and the partners have less trouble in finding each other. Another aspect the responses from the municipality have in common is the fact that the triple helix growing and getting better. Yet, improvement should focus on improving the network.

After the participants were asked about their experiences, they were asked to grade their experiences triple helix on a scale of 1 to 10. In table 3 the total average score can be found, as well as the average per partner of the triple helix.

Table 3. Grades of the triple helix experience

Partners	Overall	Industry	Education	Government
Average	6.7	6.2	6.4	7.8

The next question focused on the three triple helix configurations as described by Etzkowitz & Leyesdorff (2000) and as explained earlier in this paper. All three of the configurations were explained briefly, and respondents were asked which of the configurations would be preferred. The numbers of the answers can be found in table 4.

Table 4. Results of the configuration preferences

Configuration	Count	Industry	Education	Government
I	0	0	0	0
II	2	2	0	0
III	13	4	5	4

Following this, the participants were asked about the additional value of the triple helix. Within the education circle, the given answers were fairly homogenic. The biggest, most notable additional value of the triple helix is the creation of a network. Additional values that were mentioned were using each other's expertise, learn from each other, easier communication and thinking together, which can all be seen as the benefit of a network. The creation of a network was also seen as one of the biggest additional values within the industry circle. Where all but one participant mentioned that the shorter, informal, connections that are made were beneficial. The group was truly homogenic on this point. The triple helix has resulted in easier communication between partners, and between the different partners. Another benefit of the triple helix is that the link to internships is easier. Which is a benefit for not only the industry, but also for the education circle. The final benefit, resulting from the additional value of the triple helix, is that the industry has easier access to the knowledge the other groups have. Which comes back to the benefits of the network. When the participants from the municipality were asked about the additional value of the triple helix, their answers were, again, very homogenic. The first thing that was mentioned was the fact that the building of a network was the biggest value. This network would not only increase the likelihood of placing interns for schools, but also increase the chance of project-based cooperation. Within such a network, the different partners use their own expertise to strengthen each other, which is something that did not really happen before the triple helix.

With regards to the obstacles of the triple helix model, the education circle has a very high level of homogeneity. The main obstacle that the education circle has, is the lack of flexibility.

Which is mainly the case because of the fixed schedule most schools are bound to. But also, time is an issue. Cooperation takes time, and especially with a fixed schedule, finding time to work on networking is hard. The obstacles mentioned by the different entrepreneurs were very similar, thus resulting in a high level of homogeneity.

The most frequently mentioned obstacle by the industry participants is the lack of flexibility from the other two partners. Which was not only because of the fixed schedules of schools, but also because of the administrative procedures a municipality has to work through. But also, the lack of flexibility for the entrepreneurs is notable, seeing as the cooperation has to be done in their free time, which they often do not have, have very little of, or is costly. Furthermore, the fact that commitment is missing was also an issue that was mentioned more often than not, which was shown by the fact that the municipality is often the first partner to lose interest, or the first one to stop participation. Finally, two issues that were mentioned, where each participant mentioned at least one from, is the lack of initiative and disappointment of others. Both of which can be combined with a difference of expectations, which was mentioned by one of the participants. Since a difference of expectations, of each other and in general, has led to disappointment and disappointing results.

When the participants from the municipality were asked about the different obstacles to the triple helix, answers differed.

Table 5. Overview of expectations within a triple helix model.

	Industry	Education	Government
Industry's expectations of:	- Commercialise projects - Execute projects - Grab opportunities	- Bring knowledge - Do research - Flexible students	- Facilitate meetings - Limit procedures - Bring ideas
Education's expectations of:	- Bring ideas - Involve students - Commit and execute	- Bring knowledge - Do research - Teach students	- Facilitate meetings - Connect people - Support projects
Government's expectations of:	- Bring ideas - Commercialise projects - Execute projects	- Bring knowledge - Be innovative - Be more flexible	- Facilitate meetings - Limit procedures - Connect people

The final questions the participants of the research were asked were very similar to the research question of this paper. Since those differ quite a lot per group, the results will not be grouped by their circle, but in fact as individual responses, and combined when similar. The participants were asked which factor has the biggest influence on the quality of the triple helix model. The factor that was named most was the creation of a network. The creation of a network of enthusiastic people that are able to communicate informally and direct, is the biggest factor of success for at least a third of the participants. In addition to this network, the network should be shown. And the additional value of the network should be communicated. Next, the fact that all three partners have to be involved intensively was named multiple times as being the most important factor of a successful triple helix. It was also mentioned, a few times, that the connection between partners should remain strong, which comes back to the principle of the network. The other factors that were said to be important were that the municipalities abilities towards the triple helix should be increased, that the triple helix should fit into, or connect to, a current schedule and that someone should take initiative in bringing together the three groups or take initiative in following up on ideas.

Even though the interview was scheduled, and questions were prepared beforehand, at some points, participants were quite focused on other aspects of the triple helix, that were not part of the interview, that they mentioned themselves. Like specific issues that were related to their own experience. Multiple participants mentioned that they were missing the link of the

triple helix to the SDGs. For the fact that the municipality of Rheden is working hard on incorporating the SDGs into their policy, the SDGs are limited in presence within the triple helix. Yet, some participants mentioned that they are more excited to work on the SDGs than within a triple helix. Someone suggested that they should be combined, since it might strengthen both.

However, they are very similar in nature, thus still relatively homogenic. One of the biggest obstacles is the lack of flexibility. The municipality is forced to work in a bureaucratic and process-based way, as described by one of the partners, whereas an entrepreneur, within the industry, is more likely to act agile, which was mentioned by multiple entrepreneurs. In the same way, involving schools is difficult as well, since they are most likely bound by schedules, which again go against the characteristics of an entrepreneur. Another obstacle that was mentioned was the fact that people might have different interests or expectations, which could lead to problems. Furthermore, another obstacle is the lack of manpower to improve the triple helix within the municipality. Finally, in practice, it turns out that the network is not as good as it seems, since the lack of central coordination, within an organization, could lead to trouble in finding the right person needed for a project.

When asked about the roles and the expectations of the three partners within a triple helix, the results were of a high level of homogeneity within each group. In order to illustrate the similarities and differences in expectations, the most prominent answers per group are shown in table 5. In which, at some points, different answers have been combined if the general idea was similar.

Another lack of SDG presence was mentioned by one of the members of an entrepreneur-organization. As even though there is an ambassador for Global Goal 8, Decent Work and Economic Growth (Klomborg, 2019), the ambassador is unknown within the organization. Which was called a missed opportunity by the participant.

5. DISCUSSION

In this section, the results of this research will be described. First, the interview questions will be analysed, during which not only the general answer in total will be interesting, but also the differences between the three groups.

In general, the experiences of the triple helix so far are very similar among all the groups. All the partners are positive about the cooperation. Yet, there is one striking difference. Among the educational institutes and the industry, the general consensus is that the triple helix could function better. At least three out of the four respondents answered the question about their experience with the triple helix as "good, but it can be better". Yet, the municipality does not mention this.

According to them, the triple helix is working very well, and it is getting increasingly better. These opposites might lead to problems, if the municipality thinks the triple helix is growing, while their partners feel like the cooperation within the triple helix is shrinking. Another problem that could occur is that the municipality is going to keep on working with the triple helix model as they are doing now, while the other partners feel that change might be better. Finally, both the industry and education circle mention that commitment is sometimes missing, and the municipality is specifically mentioned as the one that loses commitment first. This could be the reason why the municipality's view differs from the other circles. When they expect that the other two groups to finish a project and lose commitment, the other groups might feel like the municipality is losing interest.

In summary, all the groups are positive about the triple helix in practice. However, the municipality is the partner to lose commitment the earliest, but it is the most positive. These different views regarding the triple helix, the different expectations of the other partners (Pletzer, et al., 2018), or the lack of commitment (Ruuska & Teigland, 2009), could lead to problems.

The general experiences of the triple helix were also graded, as was shown in an earlier section of this paper, and in table 3. What can be seen, is that the grades are very much in line with the aforementioned experiences. The difference in experience is clearly shown. The overall grade of a 6.7 shows that the general experience of the triple helix is positive, as mentioned before. The other grades are, having heard the experiences with the triple helix, as expected. The industry and education circles have an average of 6.2 and 6.4 respectively, which is quite a bit lower than the 7.8 from the municipality. This difference, as mentioned before, can be explained by a difference in expectations or a lack of commitment from one, or more, of the participating partners.

But, expectations do not always differ. With regards to the three different triple helix configurations (Etzkowitz & Leyesdorff, 2000), the three circles are very homogeneous. 87% of the respondents see the Triple Helix III as their preferred configuration. The Triple Helix III configuration is the configuration with the highest level of cooperation, the fact that almost all participants would prefer this configuration shows that the desire to cooperate on a high level is there, and is there among all partners. This creates the opportunity to improve this cooperation, since all partners are willing to cooperate on a high level.

Regarding the additional values or the benefits of the triple helix, the responses were extremely homogenic. For almost all the participants, the creation of a network is the biggest benefit of the triple helix. Since this network not only always for easier communication, easier placement of interns or employments and increases the chance of project-based cooperation. Within this network, knowledge is shared, and different expertise's are used to strengthen each other. Other benefits of the triple helix, like easier access to resources and easier or shorter procedures are also valuable but come back to the benefit of the created network.

The most notable obstacle of the triple helix is the obstacle that was mentioned most within, and by each of the three circles. The lack of flexibility. For the education circle, the lack of flexibility is caused by their fixed schedules, within the industry circle, the lack of flexibility is caused by them already being busy and their time being valuable, the lack of flexibility within the municipality comes from them being bound by bureaucracy and a process-based way of working. All these reasons are not easily solved, but with coordination and clear expectations of one another, this should be able to be worked around. The other notable obstacle is the fact that expectations regarding projects

might differ. Which is already mentioned when the experiences of the triple helix were discussed. Finally, the need for an increasing manpower within the municipality is also an issue, that was not only mentioned by the municipality, but also by some of the entrepreneurs.

In table 5 the different expectations from the three partners of each other are shown. From this table a view things can be noted. First of all, the expectations of each other are quite similar. They do not seem as different as they were said out to be. When looking at the role of the industry, the first column, the general idea is that the industry's main task is to execute projects. Yet, the other two partners expect the industry to be the partner to bring ideas to the table, whereas the industry expects the municipality to bring ideas. This could lead to problems, as this could be one of the reasons why projects might not start. Another expectation that the industry might not see as important for them, is the involvement of students. Since, in order to fully use the triple helix, the educational systems must be involved as well, as this is what the education circle expects of the industry. When this expectation is not met, or not clearly mentioned, it could lead to disappointment within the education circle, and thus they could lose commitment.

Regarding the role of the educational circle, the expectations are rather homogenous. Yet there is one striking difference. Both the other two circles expect the students and educational facilities to be more flexible. When this does not happen, this might result in disappointment, and thus in the loss of commitment.

Finally, with regards to the expectations of the municipality, the biggest issue that arises is, as mentioned with the expectations of the industry, the input of ideas. The municipality expects the industry to bring in ideas, while this is also expected of them. This could be one of the issues to reason why new projects are less likely to succeed. This issue was illustrated perfectly during one of the interviews with one of the partners from the municipality, who mentioned that the role of the municipality is to set up a project and for the other two partners to execute the project. Which is the exact opposite of what the other two partners see as the role of the municipality.

Finally, the participants were asked what they think about the most important factors to the success of the triple helix cooperation. The most important factor is the creation of a network. A network allows for easier communication and an easier sharing of knowledge. The other frequently mentioned factor is that all partners should be involved, coming back to commitment. Furthermore, the fact that initiative was missing was mentioned. Yet, this could be explained by the differences in expectation with regards to the input of ideas. Ultimately, according to multiple different participants, from different circles, the link between the triple helix and the SDGs is missing. Using the SDGs in combination with the triple helix, was suggested by one of the participants and might actually be part of the solution.

Thus, at the end of the discussion, multiple different benefits, issues, expectations, and comments have been noted. Some were mentioned more often than others, and some were worded differently. But in general, three different themes, of factors, can be identified. The first one being the creation, and usage of a network. A network was seen as the most important benefit, and key factor of success, of the triple helix model, and should thus be used further. Another theme that was seen in the discussion, is that expectations differ per partner, this would be the reason that projects fail and thus should be managed. Finally, the lack of commitment is a common theme, yet so is the lack of the link to the SDGs. It could be smart to combine these two problems, to solve both problems.

6. CONCLUSION

Coming back to where this research started with, the objective of this research was to find a way how the municipality of Rheden can improve the usage of the triple helix. The research questions, set up to reach this objective, is: *“What factors contribute to the quality of the cooperation between entrepreneurs, educational institutes and local government (triple helix model) of a medium-sized municipality that collaborate on UN SDG-driven projects?”*

Based on this research, there can be concluded that there are three main factors that determine the quality of the triple helix model.

The first factor is the creation of a network. The creation of a network is crucial, as a network not only allows for easier communication, it also increases the ability of project-based cooperation. Short lines in combination with a possibility of informal communication was said to be one of the key reasons for participating in the triple helix model. The quality of this network is important since communication was said to be crucial in project success. This factor is in line with Lahi (2019) who argues a more active private sector and academia is needed in order to tackle grand challenges, like the SDGs. The open communication is proposed by Ruuska & Teigland (2009).

The second factor that contributes to the success of the triple helix model is the fact that expectations should be matched and managed, as suggested by Pletzer et al. (2018). As this research shows, the expectations from one partner of another are not always like what one partners expects from themselves. The expectation regarding the flexibility is one of the most crucial expectations, as that is an issue for multiple partners. Managing the expectations of each other is big step on the road to improving the triple helix model. Ruuska & Teigland (2009) also mention this and call for a project charter. In which not only expectations are discussed, but also resource allocation and planning.

The third, and final, factor that contributes to the quality and success of the triple helix is commitment. According to this research, the lack of commitment is one of the most frustrating, and most crucial parts of triple helix success. Seeing as, if one of the partners of the triple helix loses commitment, projects tend to continue less often, or less successfully. The lack of commitment is suggested by Ruuska & Teigland (2009) with the input of resources, which includes the input of time and energy.

In summary, the three factors that contribute to the quality of the triple helix model are the creation and usage of a network, the matching and management of expectations and commitment.

These three factors are all in line with literature, seeing as they can all three be found within the theoretical framework that was established. Yet, using the introduction of SDGs as motivator is something that has not been researched yet. But as this study suggests, the SDGs could be a very good motivator for the triple helix or other cooperation models.

6.1 Recommendations

As this research objective was to improve the triple helix model for the Municipality of Rheden, the results of the research will be used to give recommendations to the municipality, on how they

can improve their triple helix. The first recommendation is to increase the network. Make sure that people know who to get in contact with, and make sure that communication is as smoothly and swiftly as possible. Ensure that people know that they can contact anyone at any time. Promote the network, have informal meetings, talk frequently, in order words, make sure the network is not only there for show, but use it.

The second recommendation is to manage expectations. Managing expectations is crucial in a project. To make sure each partner knows what to expect, sit down and talk. At the start of every project, talk to each other, discuss each other's role, and make sure that every partner knows what to expect, and knows what is expected of them. This will result in more clarity, less problems and thus a smoother project.

The third, and final, recommendation is to involve the SDGs more prominent in the triple helix. Combining the SDGs with the triple helix will result in higher commitment. People are triggered more easily by the SDGs than by the triple helix. Using the SDGs could be a valuable tool to ensure commitment, this could be in the form of putting the related SDG within the name of the project, or making sure the ambassador Global Goal 8: Decent work and economic growth is involved more within the triple helix. Of course, it is still of importance that people remain commitment regardless of SDG presence. But using the SDGs as a motivator, or tool, to ensure commitment, and maybe even attract new members of the triple helix, would be very valuable.

6.2 Further research

Further research should focus on different cases. This case study based on the Municipality of Rheden, a municipality that is already working with the triple helix model, towards the SDGs. Further research should focus on whether the same factors are of relevance for other municipalities, not focused on the SDGs, are not already working with the triple helix model.

Furthermore, this research is limited due to time constraints and the limitation of participants in the research. Further research should focus on getting more participants and more responses to find out if there are other factors that contribute to the quality of the triple helix model.

Another aspect that should be noted is that the government circle in this research is a medium-sized municipality. Further research should focus on how the government circle of the triple helix is different when it is a municipality of a different size, or when the municipality is replaced by a national or provincial government.

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9. APPENDIX

9.1 Appendix A - Interview guide

This guide was used as a general guideline for the semi-structured interviews.

Question	Based on:
What is your function? And what is your role within the triple helix exactly?	General, introduction
What are your experiences with the triple helix so far?	General, introduction
If you were to grade the triple helix so far, between 1-10, what would it be? And why?	General, introduction
Which of the three configurations of the triple helix would you prefer? And why?	Etzkowitz & Leyesdorff, 2000
What is for you the additional value of the triple helix?	Ruuska & Teigland, 2009
What are the biggest obstacles for you, to get a successful triple helix?	Ruuska & Teigland, 2009
Expectations: What are your expectations of the government/municipality? What are your expectations of the industry/entrepreneurs? What are your expectations of the educational institutes?	Pletzer et al, 2018
What factors are, according to you, contribute to the quality of the triple helix cooperation?	General, conclusion