

# Digging Deeper with Delphi – The Four Step Alberta Approach

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**Abstract:** Originally the Delphi method was created as a systematic research process for establishing agreement and structured forecasts in groups of experts. The method is based around the idea that the agreed judgement from several experts is more accurate and valuable than the judgement from a single expert. In a traditional Delphi study, the selected experts respond to several rounds of questionnaires with aggregated and shared answers among the expert group. A highlighted strength of the Delphi method is its ability to progress into new forms and implementations. Delphi studies have been used for different purposes such as identifying trends, creating guidelines and to develop theory. The aim of this study is to describe and discuss the Delphi study approach that has been developed by researchers in Alberta, Canada. In an effort to dig deeper into the ongoing transformation of higher education for technology enhanced and lifelong learning, the four steps were further modified in a Swedish Canadian study. In a qualitative Delphi study, the four steps were implemented as 1) A literature study to explore the chosen topic, with the selected publications sent out to the expert panel, 2) A survey with questions to the experts based on the findings in the literature study, 3) Email interviews to dig deeper into the answers from the survey, and finally 4) Focus group interviews based on the results from the previous steps. Findings from the various steps have been presented at conferences and published in research journals. The conclusion is that this modified and extended Delphi process has generated a rich set of data that can be used to develop a theoretical framework. At the same time the presented four step approach is time consuming and requires a research team that can work together during a longer time period.

**Keywords:** Delphi method, Delphi studies, Structured expert forecasts, Qualitative research, The Four Step Alberta Approach

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## 1. Introduction

Scientific research is based on important principles, but research methods are entities under iterative and incremental development. To explore new and complex phenomena in contemporary research there is a need for methods that can go deeper than the standard methods for data collection. The Delphi method was originally created to facilitate a systematic research process to establish agreements for structured forecasts by groups of experts (Sablitzky; 2022). A fundamental idea with the Delphi method is that the agreed judgement from a group of experts is more precise and of more value than the judgement from a single expert. Originally, the method was originally a way of establishing consensus. However, the aim of a Delphi study is to establish to what extent experts agree on a specific subject (Humphrey-Murto et al., 2017; Romero-Collado, 2021). In the traditional design, the expert panel responds to three rounds of questionnaires where the answers are shared among the members in the panel.

As pointed out by Grime and Wright (2016), one strength with the Delphi method is the ability to develop into new forms and implementations tailored to specific research studies. This illustrative case study aims to describe and discuss a Delphi study approach that originally was developed in Alberta, Canada. The further elaborated implementation described in this paper has been designed in a research collaboration between researchers in Canada and Sweden. Instead of the traditional three rounds of questionnaires in a Delphi study, the Alberta approach involves the four steps of 1) An initial literature study to explore the chosen topic of the study, where the selected publications later were sent out to the Delphi expert panel with a reading assignment, 2) An online survey with questions to the expert panel that was based on the findings in the literature study, 3) Email interviews were conducted to dig deeper into the answers from the survey, and step 4) Two Focus group interviews conducted based on the results of the previous steps. A description of the literature study in the first step can be found in Håkansson Lindqvist et al. (2020), and a preliminary analysis involving all the four steps was presented in Jaldemark et al. (2022). More detailed analyses of the findings have been aggregated in two journal articles that both are submitted, but are still in various degrees of revision.

## 2. The Delphi Method

As presented by Sablatzky (2022), the Delphi Method is a survey technique that researchers use to gain a consensus of an expert panel in a specific field. Expert recommendations and conclusions from data analyses should be carried out through several rounds of questioning and data collection. The Delphi method was developed during the 1950s and 1960s by the RAND corporation to address national security threats during the Cold War. Since then, the method has evolved. Today, the method is today frequently used in a wide variety of research fields, such as marketing, health science, education, and information science (Sablatzky, 2022). Over the years, the method has been modified and adapted in a myriad of ways to better serve in the different research fields and study aims. Therefore, a simple description of the Delphi method is not easy to formulate in a short summary (Grime & Wright, 2016).

An important initial step is to select a diverse group of qualified experts. The purposive selection of these experts should be unique for the study design and the research aim (Grime & Wright, 2016; Sablatzky, 2022). Some more general guidelines for the creation of an expert panel that were recommended by researchers with Delphi experience are: 1) To use experts with relevant domain knowledge, 2) To create a heterogeneous expert panel and 3) To have a panel with between 5 and 20 experts (Rowe & Wright, 2001). As a data collection method, a Delphi study could use both quantitative and qualitative, or mixed method approaches. These approaches are useful in the study of complex phenomena that could be hard to define (Rowe & Wright, 2001; Lilja et al., 2011). Frequently used data collection methods in Delphi studies are surveys, interviews and focus groups (Egan et al., 1995; Lilja et al., 2011).

Moreover, the Delphi method has been adapted for qualitative research and "used in an array of different contexts, where expert knowledge is needed to inform decision making or to understand a phenomenon in greater depth" (Brady, 2015, p. 2). In the field of education and lifelong learning Delphi studies have been fruitful: "Delphi studies have been useful in educational settings in forming guidelines, standards, and in predicting trends" (Green, 2014, p. 1). In a study by Mirata et al. (2020), a four step Delphi design was used to identify, categorise, and prioritise the challenges of adaptive learning in higher education. In similarity with the four-step design presented in this paper, the Mirata et al. (2020) study also contained a pre-step to build a foundation for the remaining four main steps. Another resemblance with our Alberta approach is how internal validity was strengthened by discussions among the members of the research team (*researcher triangulation*), and the strife for reliability by descriptions of how the single rounds of the Delphi study built on each other (Mirata et al., 2020).

## 3. The Four Step Alberta Approach

According to Okoli and Pawlowski (2004), the Delphi method of capturing an expert review of issues or phenomena has often been used in conceptual framework development. The development of a conceptual framework has also been the overall purpose of this study, with a first framework draft presented in Jaldemark et al. (2022). Together with a pre-step and a final post-step the Alberta approach could be summarised as in Table 1 below.

**Table 1. The various steps in the Alberta Approach**

Pre-step	Dec, 2021	Literature review Invitation to experts
Step 1	Dec, 2021	Online survey
Step 2	Jan, 2022	Reading assignment
Step 3	May, 2022	E-mail interview responses
Step 4	June/July, 2022	Focus group interviews
Post-step	Feb, 2022	Validation of focus group summary Preliminary conceptual framework

### 3.1 Pre-step

This Delphi method expert review was a process that engaged relevant experts to respond to significant questions which were initially developed through a systematic review. A literature review with a focus on the

two constructs of lifelong learning and higher education reform, to answer the question of which key themes of lifelong learning, if any, are emerging in higher education reforms (Håkansson Lindqvist et al., 2020). The topic of the review, and the research question, were defined in discussions among the research team with the purpose to retrieve literature that provides background information that could enrich the Delphi study. None of the selected publications had any alignment to anyone in the expert panel. As each member of the research team is from an institution that offers online and blended higher education for over a decade, up to three participants from the researcher’s home faculties were invited to participate in the study. A purposively drawn sample of experts was selected. The sample included faculty and instructional designers with research, learning, teaching, and/or design experience in online and blended higher education and/or lifelong learning. This panel of experts was asked to review selected readings from the literature synthesis.

### 3.2 Step 1

The Delphi method draws upon both quantitative and qualitative data, via survey, individual interview and a focus group with the invited experts. The first step consisted of an online survey that was completed by seven participants. First, the survey was used to collect background data about demographic information, experts’ profile and knowledge about heutagogy and lifelong learning. The survey questions focused on examining the relationship between heutagogical practices and blended and online learning and lifelong learning. Data was analysed in developing a greater understanding of the experience and expertise of participants as well as their current understandings of the concepts and the relationship between the concepts. One way of structuring the survey answers was to divide them into the past, the current, and the future of technology enhanced lifelong learning in higher education. The analysis of the survey answers was later used as a foundation for the formulation of the open-ended questions in the email interviews.

### 3.3 Step 2

In the second step, following the survey, participants were given selected reading assignments. Based on selected readings from the literature synthesis of five articles, each expert was assigned selected articles to read. Articles were partly distributed randomly, and partly with the idea of getting opinions from experts from another continent than where the article studies were conducted. The common theme for the articles was the transformation of higher education for technology enhanced lifelong learning. This reading assignment provided further background on the relationship between the three concepts being investigated in the study. These articles were identified in the literature review and were chosen as a reading assignment for the panel experts. All panel experts received two or three articles to read, and all of the articles were read by more than one of the experts. The experts were also informed that the reading assignment did not involve a review, but thoughts and reflection related to the themes. The reading assignment was based on the articles presented in Table 2 below.

**Table 2. Selected publications that were sent out to the expert panel**

#	Article
1	Baptista, A. 2016. Revisiting lifelong learning in light of the Bologna process and beyond. <i>Lifelong learning: Concepts, benefits and challenges</i> , 17-35
2	Boyadjieva, P., & Ilieva-Trichkova, P. 2018. Lifelong learning as an emancipation process: A capability approach. In <i>The Palgrave international handbook on adult and lifelong education and learning</i> (pp. 267-288). Palgrave Macmillan, London.
3	Ishak, M. M., Ali, H., Rahim, F. A., Bakar, M. S. A., Ariffin, T. F. T., and Malaysia, S. K. 2018. Managing Learning and Teaching Orientation of Online Centered Approaches in Higher Learning: “MOOC” and Beyond. In <i>Educational Access and Excellence</i> , 1, 119.
4	Kasworm, Carol. 2020. Adult Workers as Learners in the USA Higher Education Landscape. In <i>Inequality, Innovation and Reform in Higher Education</i> , pp. 221-235. Springer, Cham.
5	Weil, M., and Eugster, B. 2019. Thinking outside the box: De-structuring continuing and higher education. <i>Disciplinary Struggles in Education</i> .

### 3.4 Step 3

After reading the articles, the Delphi experts engaged in email interviews where they were asked questions based on the analysis of the survey and the selected articles. In a questionnaire they were asked open-ended

questions such as: *How often do online learning, including blended learning, instructional design and teaching practice provide opportunities for student self-determination? And if they do, can they influence online learning and lifelong learning? Based on your experiences, what successes and what challenges have you faced in implementing specific aspects of the heutagogical design. Please describe any organisational and technology support used and 2) evidence of impact, if any, on student outcomes.* First the interview data was thematically analysed as outlined by Braun and Clarke (2006; 2012). The review of the data from the survey and interviews were combined and summarised into a two-page summary document that was shared with the experts who participated in the study. Later the data from the e-mail interviews were analysed according to the Grounded theory idea of 1) Open coding, and 2) Axial coding. Findings have been structured and presented in a journal article that is submitted and under review.

### 3.5 Step 4

In the fourth step, all Delphi experts were invited to participate in a focus group discussion to discuss the proposed conceptual relationships. Due to the different time zones in Canada, US, Europe and Australia, the expert panel was split into two different groups. Within the context of blended and online learning, the following two questions guided this inquiry: (1) *Heutagogy and lifelong learning are similar yet are different, unpack the nature of the relationships; and (2) Review the list of Blasckhey's (2012) heutagogical principles of learner agency, non-linear learning and design, capability/self-efficacy, and reflection/metacognition. What are the things in the design of heutagogical practice that have the greatest impact in relation to technology enhanced lifelong learning?* Both focus group discussions were held online in the Zoom video conferencing system where the discussions were recorded as MP4-files. The files were then transcribed and from the long transcripts of the focus groups, a two-page summary was developed and shared with the experts for validation. Preliminary findings from a first analysis were presented at a conference (Jaldemark et al, 2022). A deeper analysis, together with the results from the findings in the analyses of Step 3 is work in progress.

## 4. Discussion

The aim of this paper was to describe and discuss a Delphi study approach that originally was developed in Alberta, Canada. The four step Alberta approach in this Delphi study involved a pre-step and a final post-step. The panel experts were involved in the four steps of a survey, a reading assignment of selected reading, an email interview, and focus group interviews. The question of issue is what specific contribution the Four Step Alberta Approach provides, compared to other Delphi studies, and why the pre- and post-steps add value. To involve a pre-step where the expert invitation was combined with a literature review appears to comprise a valuable extension. The authors, of course, had some previous experience and knowledge about lifelong learning in higher education, but the review resulted in deeper knowledge about reform initiatives and recent related research. The findings from the literature review were of help, in all the following steps, and in the formulation of questions for the survey and the interviews. Moreover, asking the expert panel to review the publications that were selected from the literature review increased the focus on different aspects of the transformation of higher education for lifelong learning in the current digital era (Baptista, 2016; Boyadjieva & Ilieva-Trichkova, 2018; Ishak et al., 2018; Kasworm, 2020; Weil & Eugster, 2019).

The survey in Step 1 could be perhaps considered to be the most traditional part of this Delphi study. Here, there are interesting results that were divided both on a timeline and on granularity level which contributed to the micro-level, meso-level and macro-level. Furthermore, the survey answers gave important information regarding what was categorised as 'Dominant views' and 'Emerging issues'. Some examples of dominant views from the answers are neoliberalism, corporate and utility values, academic activism, societal engagement, ecological growth, decolonisation and digital transition. Emergent issues brought up in the answers were part-time students living off campus, the increasing use of digital technologies, climate crisis sustainability, and access to education for all. Before the reading assignment was sent out in the second step, the authors discussed how much reading that could be sent out to the experts. Almost all of them work full-time at different universities and with ambitious ongoing research as well. The decision was to cut down from three to two publications, and with a distribution of the texts so that there always was more than one person who read every article. The articles were mainly selected for the reason that they contributed to describe the complex study phenomenon, but also to provide input from different parts of the world, as well as different aspects of lifelong learning. As highlighted by Billet (2010), it sometimes makes sense to make a distinction between lifelong learning and lifelong education. This is in line with the perspective of lifelong learning as an individual capacity building and a personal emancipation process, which was mainly represented in Boyadjieva and Ilieva-Trichkova (2018).

The email interviews that were sent out resulted in answers beyond expectation for a structured interview. Most of the questions were based on the articles in the reading assignment. These questions resulted in many interesting comments and relevant recommendations from the experts. After an initial preliminary thematic analysis, the interview answers were reanalysed more thoroughly as part of the third step. With the Grounded theory idea of Open coding, two different analyses were carried out, before the two analysing authors discussed the two different analyses to compare the similarities, dissimilarities and relations in the findings. Following this, the two different Open Coding analyses were sent to a third investigator in the Delphi study research team for a further analysis involving comparison and merging of found codes and subcodes. The final step of the Open coding involved further discussions among the authors where codes and subcodes were grouped into preliminary categories. According to the Grounded theory concept of Axial coding the categories from the Open coding process were revised and organised around a central category (the phenomenon), with relations and dependencies to the other categories (Vollstedt and Rezat, 2019). As an answer to the posited research question: What are the critical aspects of higher education transformation for lifelong learning in a digital era?, the categories of 'Infrastructure', 'Multimodal delivery', 'Pedagogical change', 'Financial aspects', 'Quality and organisation', 'Digital literacy', 'Accessibility', and 'Equity, diversity and inclusion (EDI)', were aligned around the central category 'Higher education transformation for lifelong learning'.

In the fourth step, the focus group interviews were divided into two groups to cope with the different time zones in America, Europe, Asia and Australia. Following the main idea of focus groups with researchers as moderators more than interviewers, the panel experts led the discussions. Both focus groups sessions were recorded, with audio and video for the data analysis. In the post-step after the data analysis, a validation was conducted where a summary of the interview transcripts was sent to the experts. The validated results from step 4 were used as a foundation for the preliminary framework presented in Jaldemark et al. (2022). In the future, this framework could be applied by higher education institutions in lifelong learning initiatives. However, in order to refine the framework, a confirmatory coding is currently being conducted. As outlined for quality data analysis, the open coding and the axial coding processes should be followed up and refined with confirmatory coding (Neuman, 2006). The updated framework and the results from the confirmatory coding will be presented as a journal article that will be submitted during the second half of 2023. Finally, the four-step approach described here has been used for the first time in a study that was conducted during the pandemic. Parts of the described steps can be further developed, and as an example the structured email interviews could be conducted as semi-structured interviews face-to face. In this study the focus groups were divided by time zones for a study that involved experts from four continents. A Delphi study with a smaller geographical spread could get a richer discussion with all experts in a larger focus group.

## 5. Conclusion

Every research study should have its tailored methods, and the adaptation and refinement of traditional methods is a continuous process that researchers have to struggle with. The described implementation of the Delphi method worked well for the actual study where it was used. On the other hand, to carry out a Delphi study this way is time consuming, and probably too slow for more traditional Delphi studies aiming at a relatively rapid consensus on an urgent topic. The authors' intention is to develop the method further. However, exactly how this will be done, must be aligned to the chosen topic and study purpose where it should be applied.

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