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CONNECTING CURRICULUM TO INDUSTRY:
A Comparative Study on British and Korean Cases of Design Collaboration

ABSTRACT:

This paper is based on two design collaboration cases between university and industry. The design projects were carried out in two very different cultural environments and circumstances: Great Britain and South Korea. The intention was not simply to compare and contrast the two cases, but rather to extract various issues to be generally considered for more effective collaboration. The lessons learned reflected the differences and contributed toward the major benefits of such collaboration for British and Korean education, viz. enhancing the employability and professionalization of students from the educational point of view. Naturally, there were many benefits for industry, too. A cultural connection was made by the lessons commonly found, while the contrasting nature of the settings within which the projects were initiated and carried out supported the credibility of such lessons and benefits.

The research aims to establish:
- what may trigger a design collaboration between university and industry;
- how cultural and circumstantial differences may influence the pedagogy and collaboration process;
- the beneficial focus for British and Korean design education, as well as the beneficial convergence from both;
- various issues and a possible framework for a strategic curriculum development for preparing students for real-world practice that could be applied in different cultures and circumstances.

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The research investigates the questions established above through qualitative analysis of the cases presented. The nature of this enquiry is rooted in studying of phenomena which can be best achieved with qualitative methods. In an educational environment, in particular, case studies can be used as a substitute for life experience. As a research method, case studies can develop theories by detailed analysis and simulate reality.

The way a design collaboration project between university and industry is initiated could be widely varied. The British and Korean cases testified to this. The company approached the university with a clear purpose in the former, while the projected was initiated by the university's educational need based on a pre-defined agreement with the company in the latter.

The contrast was extended to the industrial sectors of the participating companies, viz. kitchen sink in Britain and consumer electronics in Korea. The attitude of the companies were very different also. The British company was desperate for a solution and turned to the students as a last resort, while the Korean company was rather laid back. If the British case represented a high-level initiation/high-level execution model in terms of the hierarchy of the employees involved, the Korean case represented a high-level initiation/low-level execution model. The latter model revealed a danger in the process of task delegation and the lack of drive in the person put in charge.

A more systematic and extended research process was used in the Korean design project than the British, since the former involved post-graduate students as opposed to undergraduates in the latter. Surprisingly, little difference seems to have been found in the quality of the design proposals in their expected standards. This could be due to the difference in their respective educational culture. The lack of systematic research in the British case seems to have been compensated by the quality of research, but above all, more successful application of the research outcome to the design solutions than in the Korean case.

Both British and Korean students benefited from a pedagogy that employed a strategic approach to design process that better prepared students for reality. This pedagogy seems to have contributed significantly to the successful outcomes that the companies enjoyed greatly. Not only could the companies identify potential employees, one of the benefits of university-industry collaboration traditionally considered, but reap direct commercial benefits from the design proposals. Educationally, the students also enjoyed a consultancy-like working environment in terms of design brief, market/technical intelligence, proximity to reality and the relationship with the company. Another educational benefit that does not seems to have been traditionally identified is for the educators themselves.

The findings can be converged toward the issues to be considered for developing a strategic alliance between university and industry, and a suitable curriculum in both cultures and a broader context. These include clearly defining and agreeing the scope of the project, expected outcomes, benefits for both parties, maintaining focus and communication, delivering suitable pedagogy more akin to professional practice.

1. INTRODUCTION

This paper presents an investigation into important issues that surround the complex dynamics at work in a collaborative design project between education and industry. There are many considerations for such a project: collaboration design, various communication channels, pedagogy, the need to consider both educational and business objectives, organizational/educational/national culture, human resource management for very different groups of people. In order to uncover the complexity and multi-faceted nature of such collaboration, two very different cases in term of context, circumstance, educational backgrounds and culture were examined. The findings culminate, through comparative analysis, in strategies for an effective collaboration.

The intention was not simply to compare and contrast the two cases, but rather to extract various issues to be generally considered for more effective collaboration.

The research aims to establish:

- what may trigger a design collaboration between university and industry;
- how cultural and circumstantial differences may influence the pedagogy and collaboration process;
- the beneficial focus for British and Korean design education, as well as the beneficial convergence from both;
- various issues and a possible framework for a strategic curriculum development for preparing students for real-world practice that could be applied in different cultures and circumstances.

Chapter 2 discusses the methodology employed for the research. Chapter 3 deals with various issues arising from the initiation of a collaborative project. The collaboration projects themselves in Britain and Korea as well as the contents and circumstances are presented in Chapter 4.

Chapters 5 and 6 present the findings of the empirical research on the effects on design outcomes, pedagogy and cultural aspects through students' responses.

The research concludes with discussion and elaboration of findings in Chapter 7.

2. METHODOLOGY

The research method employed for this study is largely based upon a qualitative analysis of the cases presented. The nature of this enquiry is rooted in studying of phenomena which can be best achieved with qualitative methods (Esterby-Smith *et al*, 1991, Strauss and Corbin, 1990). In an educational environment, in particular, case studies can be used as a substitute for life experience. As a research method, case studies can develop theories by detailed analysis and simulate reality (Langrish, 1993).

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The initiation and collaboration details are mainly constructed from various collaboration and project documentation, as well as the accounts of real-life experience by the author as an initiator and/or participant of the collaboration projects.

The benefits of collaboration and cultural issues are based on in-depth interviews with the participants. The interviews were recorded and subsequently transcribed. Content analysis was carried out on the interview material, which was text-coded for qualitative analysis with statistical information. The codes were divided into three large categories according to the nature of remarks: perception of students, willingness/ability to follow instructions, effects on outcome.

Once the textual codes were categorized to answer the critical questions, the codes were then converted into meaningful statistical information, i.e. how many answered each question. Any duplicated answers were noted. This statistical information was put into tables by each question which were then used to draw charts to illustrate the findings visually.

The methodology for pedagogy is discussed in 4.6

3. INITIATION

Any collaboration between two parties can be initiated by one, but the need for collaboration has to be felt by both. This need can exist explicitly or potentially. It could be deemed that the party with an explicit need tends to initiate a collaboration, but interestingly, both parties can agree on potential needs until the needs surface. The British case represents the first model while the Korean case the latter.

3.1. THE BRITISH CASE

A leading kitchen sink manufacturer with 45% share of the market in value terms, approached the Industrial Design department, Manchester Metropolitan University. Their approach was out of a real need – to break out of a stalemate. The market was saturated and there was little prospect for growth. The company diagnosed the situation and prescribed a cure – product differentiation through design. They attempted to differentiate their products with various resources, including the internal design team as well as outside design consultants. The company turned to the university as a last resort because all these efforts failed.

The collaboration began with a high-level initiation, by the technical manager who effectively acted as managing director. The design head was actively involved as well. The technical manager personally took charge of running the project from the company's end.

Therefore, this collaboration represented a high-level initiation/high-level execution model with an effective channel for command, communication and co-ordination.

3.2. THE KOREAN CASE

The Department Industrial Design at KAIST struck a deal with a multinational consumer electronics giant for a possible collaboration for the near future. The deal was part of the BK21 (Brain Korea for 21st century) initiatives by the Government. The funding size was decided and the area for collaboration was loosely determined without any specific detail. When the principal author of this paper felt the need for a design project course based on a collaboration with industry, he approached the company on behalf of the department. An initiation was agreed and details of collaboration were worked out.

The collaboration also began with a high-level initiation in this case as well. The difference from the British case was that the initial approach was made by the university rather than the other way around. The approach was made to a high-level personnel, an executive director and the head of the Mobile Communications Unit (MCU) at the company's large-scale Design Center. The main difference from the British case began when the director delegated the task of running the project. Firstly the task of delegation itself and the interim management of the project until the delegation was made to an appropriate personnel was allocated to two middle-management personnel at the Planning Section of the Unit. Only then was the project delegated to a manager-level personnel.

Therefore, the collaboration in the Korean case represented a high-level initiation/low-level execution model. Although the manager put in charge of the project was an experienced designer with important responsibilities, he was 'put in charge' of the project from above amidst of his other busy commitments. This meant that the real need or rationale for the collaboration was somewhat lost in the command chain.

4. COLLABORATION

4.1. INDUSTRIAL SECTORS AND SIZES

The British firm was in kitchen sink manufacturing. The product is relatively low-tech and the technology is mainly involved in synthetic materials, since the firm's strength was in synthetic coloured-sink. The company's market share in coloured-sink market in the UK was 75% as opposed to 45% in the overall sink market, including stainless steel. Although the company was a subsidiary of a much larger American corporation, the British operation was a medium-sized firm employing 250 people.

In contrast, the Korean firm was representative of a huge conglomerate. The company was employing 31,614 within South Korea and further 35,000 overseas. Its turnover totaled 30.8 billion USD in 2004. There were over 500 designers in its Design Centre alone. The industrial

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sector was consumer electronics, but the project was to be on mobile communication devices, which represented a high-tech digital sector.

4.2. COMMUNICATION CHANNELS

4.2.1. THE BRITISH CASE

The communication between the university and company was mainly done with the initiators from both parties, i.e. the course tutor from the university and the technical manager from the company. Day-to-day communication or simple questions were directed to the head of industrial design, who also acted as a communication channel for the students. Communication between the tutorial team and the students largely consisted of the initial seminar, regular tutorials and casual questions/feedback. The tutorial support was provided on two fronts: the 'usual' tutorials with departmental academic staff and a series of tutorials by the principal author who was invited to participate in the project as a 'product differentiation specialist'. There seemed to be no special issues with the internal communication within the company.

4.2.2. THE KOREAN CASE

In contrast to the British case, the communication channel that affected the project the most seemed to have existed within the company, even before the collaboration began. The initiator from the company was a high-ranking personnel with a certain amount of enthusiasm for the collaboration project. However, the project was to be delegated to an important, but lower-ranking personnel. The communication channel for this delegation process was rather complex and this caused a problem. The delegation process was communicated through an interim management, seemingly without the consent or understanding of the person to be put in charge of the project. This seems to have caused offence. As such, there was a great difficulty in proceeding with the project in the beginning due to the attitude of the project manager. This is further explained in 3.3.

The complication caused initial difficulty in the communication between the university and the company. No one seemed to be in charge. When the initial complication was resolved, the main communication channel was delegated to a relatively junior-level designer who conveyed to the project manager the communication with the university. Students were encouraged to use this communication channel for their design project. This channel turned out to be rather inefficient. This may have been due to the lack of enthusiasm of the project manager, or simply the person not doing his/her job well.

The communication between the students and the course tutor was mostly carried out in the form of lectures, presentations and tutorials.

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4.3. ATTITUDE OF COMPANIES

The attitude of the British company could be described as being at least 'earnest', or 'desperate' at most. This was firstly because their internal efforts to differentiate their products failed. The company's analysis of this being such was that it was too 'specialized' in and what one perceives as the kitchen sink, too much aware of various constraints. Using best outside design consultants did not help. They thought that design students might just do the trick of providing totally fresh approaches to the product (Nam, 2001). Secondly, the command structure was streamlined due to the company being an SME in terms of size. Everyone involved, including the technical manager who initiated the collaboration and the head of design understood the need for the collaboration and just as eager to make the collaboration a success. As such, the company was very interested in and helpful to the running of the project.

In contrast, the attitude of the Korean company could not have been more different. At the initiation level, there was a certain level of enthusiasm and expectation. However, when the project was delegated to the manager through the interim management, there was a distinct lack of will to proceed. In fact, even resistance to the project was noticed. As it turned out, politics was at play. The manager put in charge of the project was not at all happy about the situation that the project was 'dumped' on his desk. As a result, the initial communication was very difficult. Only after a delicate persuasion by the author did he gathered himself and engaged fully in the project.

4.4. PROJECTS AND DESIGN BRIEFS

The aim of the British design project was to design a kitchen sink as a work station in the home, based on 'new thinking' incorporating the concept of kitchen furniture. Through design-based product differentiation, the creation of new market or new demand was expected. According to the project brief, the project requirements were to create product differentiation needed to succeed in this type of market. Visually, by special features, by cunningly meeting the needs of the user groups as students understood them. The company did not want the students to restyle what they already did. They could, can, had already done that. The company expected fresh ideas from the students who were not constrained by what had gone before (Barham 1994). The company was prepared to develop into production any good ideas with market potential.

The aim of the Korean design project was to develop a new form factor for a mobile communication (MC) device through strategic product differentiation. The MC device was to be differentiated with new functions and emotional elements in the light of the expansion of convergence devices. The development of new functions would have to fit a premium-class performance, and an optimum structure for an efficient combination of emotion and function was required (Cha 2006).

The title of the Korean project, as it was originally proposed to the company, was "Design for Mobile Communication Device through Strategic Product Differentiation". However, what the company wanted was to find a new form factor that could lead the mobile phone design into the future. Their project specification document reflected this. However, it was deemed too difficult

for the students. Whether finding a new form factor was the right question to ask was not clear, either. It seemed that they were trying to 'dump' a problem too difficult for them to solve on the students to see if they fared any better. This may seem similar to what the British company was attempting, but on a closer inspection, it had an important difference. The British company was trying to utilize the strength of the students that the company did not have – fresh approach free from the knowledge of what had gone before and practical constraints. The Korean company, in contrast, was trying to obtain an expert solution from a source which lacked expertise.

When this was perceived by the university, an adjustment to the overall goal of the project was attempted. As a result, it was agreed that finding new form factors would be attempted, but not be set an overriding aim of the project. Finding differentiating factors that would provide competitive advantage would be sufficient.

4.5. PEDAGOGY

4.5.1. WHAT IS STRATEGY-LED DESIGN PROCESS?

The strategy-led design process began with the notion that product differentiation was by nature strategic. This is because the differentiating factors would have to used as a competitive advantage. A strategy-led design process, like any other design process, begins with research. Exactly what kind of research would vary according to the aims of the design project, but it is often difficult to find potentially successful differentiating factors with product-based research only. Socio-cultural insights such as discovering potential needs/desires arising from social interactions and the culture surrounding the use of products are often required for successful product differentiation by means of design.

The strategy-led design process is designed to optimize such a discovery in the research stage and maintain focus in the concept development stage. Once potential needs/desires are identified and the market re-defined, design strategies that could best achieve the aims set on the basis of the findings of the research are now devised and explicitly stated. The subsequent concept development is an endeavor to find design concepts that could be a best way of implementing the strategies, and constantly assessing concepts against strategies.

4.5.2. DELIVERY

The pedagogy used in both the British and Korean cases was based on the same principle. A strategic approach to design process was found to be a powerful method for a successful product differentiation within individual designers' own abilities (Nam 2001). It was also found that it was an appropriate approach for students to adopt to develop a marketable design solution in a university-industry collaboration design project. Powell (2005) supports that a strategic approach to design process could better prepare students for reality.

For these reasons of the potential for successful differentiation by means of design and the proximity to reality, a similar approach used in the UK was deemed appropriate for the collaborative design project that was later conducted in Korea.

In the British case, the pedagogy for a 'strategy-led' design process included an initial seminar for product differentiation and subsequent rounds of tutorials. The tutorials not only dealt with the progress of the project in terms of developing design concepts, but reinforcement of the understanding of the issues dealt with in the initial seminar as well as giving guidance for following a strategy-led design process.

In the Korean case, a much more structured method was used for essentially the same approach. The notion of "strategy" was stressed in the very title of the project - "Strategic Product Differentiation – Mobile Communication Device". The design brief entailed a methodology for a strategic approach to design process to be adopted for the project. The brief was presented in a class and the same seminar on strategic product differentiation delivered to the British students was also presented separately in the subsequent class. This meant that the notion of "strategy-led" design process was more emphasized in the Korean case than the British.

Further, the Korean students were required to deliver presentations of their research in several stages with feedback from the course tutor. In groups, they were required to conduct literature search as well as empirical research into the market and the consumer culture surrounding mobile communication devices and the contexts in which they were used. The empirical research was funded and included focus group interviews, town-watching, user diary logging and in-depth interviews with mobile phone users among other methods with which the students were already familiar. Tutorial support began with the commencement of the design concept development phase following the research phase.

In contrast, there was no funding support for the project research conducted in the British case, and the students there were largely left at their own devices. Nevertheless, the students were supported via a series of tutorials throughout the research as well as the concept development phases, in terms of the strategy-led design process.

5. RESPONSES TO DESIGN PROCESS

5.1. PERCEPTION OF STUDENTS

It is interesting to observe that the British and Korean students responded differently to the same educational instructions. The findings of the research suggest that this is due to their preceding education and cultural aspects. The response to the strategy-led design process can be categorized into three viewpoints: positive, negative and difficult. This account is presented below.

5.1.1. STUDENTS' UNDERSTANDING OF STRATEGY-LED DESIGN PROCESS

In the British case, 7 students expressed through 16 separate remarks that the new approach was difficult to understand. The three main reasons for this were: that the approach was new to them; that the content of the seminar was of a difficult nature to understand; that the way in which the seminar was delivered was not easy to understand. For example, Mumm said that he was neither 'close to input' nor used to the concept of product differentiation. He also claimed that the introduction was "difficult to follow". Nevertheless, all these possible reasons are of a nature that could be resolved with more time and/or care in training.

In the Korean case, 7 students made 26 remarks expressing that the new approach was difficult to understand. However, the reasons for their difficulty were totally different from the British. Most of the Korean students were already familiar with a design process which seemed to them to be similar with the strategy-led design process. The two main reasons for their hardship were: that they could not reduce the scope from a previous step to the next; that they found it really hard to link the result of their research with the concept development stage. For instance, Bo-Min said, "it was the first time for me to hear that things were too broad to manage so I should reduce the scope". She went on to say, "my other tutors always told me that [think in other ways], not [reduce your idea scope]". She also claimed that she had not had chance to learn how to apply research data to concept development'. This was her difficulty in attempting to adopt the strategy-led design process as her own.

In conclusion, the British and the Korean students found the strategic approach to design process difficult for completely opposite reasons. The approach being new and seemingly familiar, respectively. It seems as if the Korean students confused the research-led design process with which they were already familiar, with the strategy-led design process. This is further elaborated in 6.1 Preceding Education.

5.1.2. POSITIVE RESPONSES

In the British case, 14 students participated in the interviews in three rounds. Among them, 8 made 22 positive remarks on the strategy-led design process. For example, Broadbent said, "the new approach helped me organize my thought". Robinson said, "it helped me understand why I was doing it and began to question about the market context of the product from early on". She went on to say, "it help me to plan and to have aims and strategies as I tried to follow the strategy-led design process. I think it was a good way of working". Tang said, "without the [educational] input, the project would have been more of a styling exercise, [rather than product differentiation]".

Participants	Positive	Negative	Difficult
Broadbent	3	0	0
Emerson	0	2	2
Fern	2	1	1
Flifford	2	0	0
Gaudio	0	0	1
Mumm	2	0	2
Orme	3	0	2
Robinson	3	0	1
Saba	6	0	0
Tang	1	1	3

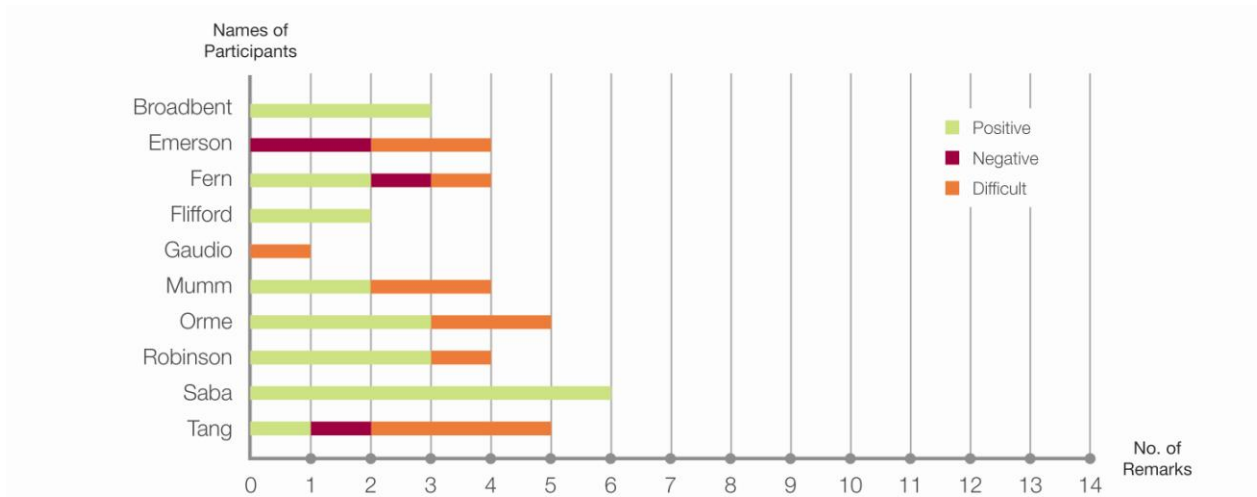Table 5.1 Number Nature of Remarks on Strategy-led Design Process (British)

Fig. 5.1 How Participants Found Strategy-led Design Process (British)

In the Korean project, 9 students took part in the interviews. 6 students expressed 26 positive remarks on the strategy-led design process. The reasons why they had positive attitudes toward the strategy-led design process appeared similar to those of the British students. Eun-Mi said, "it is clear exactly where I am in the whole design process and the approach is really good for making a logical progression". Eun-Vit said that it gave her a clear and accurate direction and helped her draw conclusions easily. Bo-Min also mentioned about the direction of the approach. She said, "the process helped me know where to go next exactly, so I did not lose myself". Mentioning about product differentiation strategy, Jin-Young Park said, "the product differentiation strategy is quite impressive to me. It does not just make a concept from some insight; it led to the strategy focused on how a new concept creates differentiation in the real market! I was shocked about that". Jong-Min said, "the strategy-led design process is more effective method for the company, because relying on the designer's inspiration solely carries too much risks" It was encouraging to see some students captured the essence of the strategy-led design process. Bo-

Min said, "I think the strategy-led design process is more important for a collaboration project between university and industry".

The account above indicates that both the British and the Korean students thought that the strategy-led design process:

1. helped them organize their thought;
2. gave them clear guidance about the process;
3. made them consider product differentiation in the context of market.
4. Was suitable for product differentiation and collaboration with industry.

Participants	Positive	Negative	Difficult
KIM, Seok-Tae	1	2	0
SHIN, Eun-Mi	0	3	2
CHUNG, Eun-Vit	0	2	3
KIM, Jong-Min	0	1	1
KWON, Mun-Young	1	3	1
KIM, Bo-Min	10	0	12
Tu Trang	6	4	4
PARK, Jin-Young	5	3	0
CHUNG Jin-Young	3	0	3

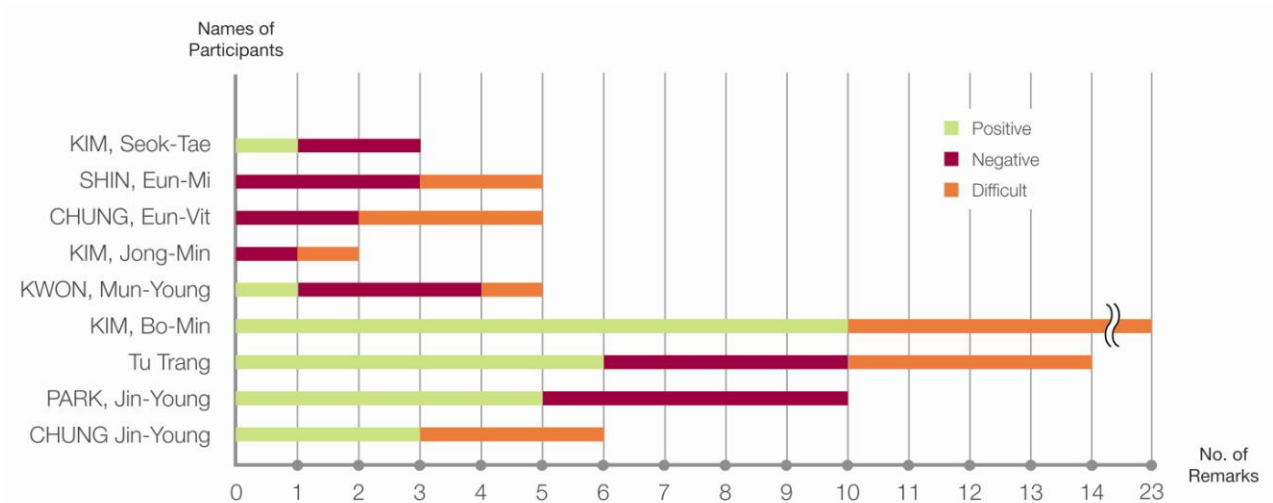Table 5.2 Number Nature of Remarks on Strategy-led Design Process (Korean)

Fig. 5.2 How Participants Found Strategy-led Design Process (Korean)

5.1.3. NEGATIVE RESPONSES

3 British students made 4 negative remarks. The three main reasons were: suitability of the new approach for the project; more work than using usual methods; confusion arising from being new. Some outright negative attitude from the outset was noticed. Emerson said that the strategy-led design process for product differentiation 'can only be judged if the outcome is successful'.

In comparison, 6 Korean students expressed 18 negative remarks out of 206 total remarks tagged. Students' negative opinions can be categorized into two factors: suitability of strategic approach; restriction on designer's creativity. Seok-Tae said, "As I understand the project is about finding new form factors, I could not understand why this process was required". Trang and Jong-Min said, "I think 'good design' can be created through strategy-led design process, but not 'wow design'".

It seems as if doubt occurred in the minds of some British and Korean students as to whether or not the strategy-led design process was appropriate for their project. The difference was that: the British students were largely concerned about the amount of work and the difficulty to follow instructions. In contrast, the main concern of the Korean students were about the process's suitability for the project and its limit on designer's creativity.

5.2. COMPLIANCE WITH INSTRUCTIONS

In the British case, 9 students expressed through 12 separate remarks their willingness and/or ability to adopt the new approach in their design process. For example, Saba claimed that the introduction was 'perfectly clear' to him and made it clearer about his intentions and helped him what was on the market. Gaudio stated that he was not certain as to how he could incorporate strategy into design process, but the adopted the new approach, which was different from his usual method. He claimed that the new approach helped him 'find a theme'. And 6 students expressed through 13 separate remarks their unwillingness and/or inability, 3 made conflicting remarks.

Participants	Willing/Able	Unwilling/Unable
Broadbent	1	0
Emerson	0	2
Fern	1	0
Flifford	1	0
Gaudio	1	1
Mumm	1	0
Orme	1	5
Robinson	3	0
Saba	2	0
Tang	1	1
Burnett	0	1

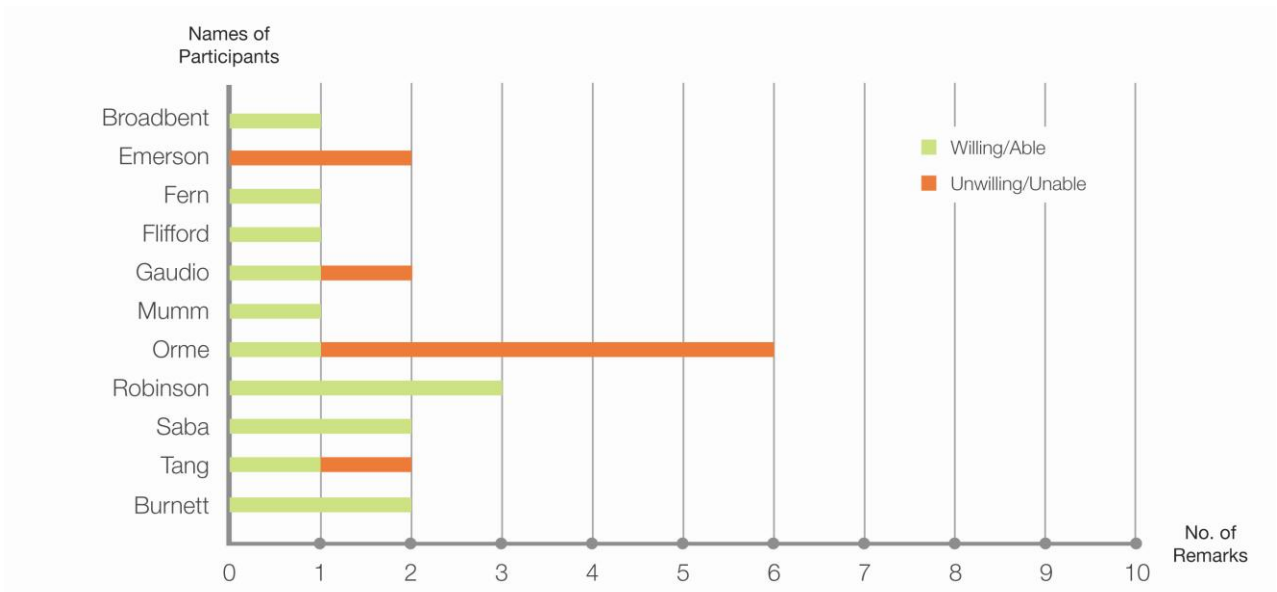Table 5.3 Willingness/Ability to Adopt Strategy-led Design Process (British)

Fig. 5.3 Participants′ Attitude to and Ability for Adopting Strategy-led Design Process (British)

Surprisingly, no Korean student made remarks in the willing/able category without making remarks in the unwilling/unable category to follow instructions. 4 students expressed through 12 separate remarks their unwillingness and/or inability. 5 students made conflicting remarks. Some students did not follow the instructions because they were so accustomed to their previous methods that they went on to do the project with their own methods. For example, Seok-Tae said, "I wasn't convinced of the strategy-led design process in that project, so I pursued my own process"

In fact, the research stage by the Korean students was assessed to be very good, but they somewhat lost their way in the subsequent steps which they had not experienced before. Jin-Young Jung, despite having expressed conflicting remarks, showed a proactive attitude toward adopting the new approach. He did not stopped at follow the process, but went further by adapting it to his own situation. He stated, "I controlled the intensity of the strategy-led design process for my project". However, he pointed out that there was always trouble in the concept development stage which in his opinion could not be resolved by the process. It was 'up to the designer's creativity'. Other students who gave conflicting responses said that they wanted to follow the instructions and they thought that they did so at that time. For instance, Bo-min said that "during the project, I thought that I did what the professor suggested, but the professor did not think so. After finishing the project, I realized that we had some miscommunication with each other". She also pointed out that the students did not utilize the communication channel with the company.

Participants	Willing/Able	Unwilling/Unable
KIM, Seok-Tae	0	2
SHIN, Eun-Mi	2	2
CHUNG, Eun-Vit	0	1
KIM, Jong-Min	2	8
KWON, Mun-Young	0	4
KIM, Bo-Min	3	5
Tu Trang	0	5
PARK, Jin-Young	1	1
CHUNG Jin-Young	1	1

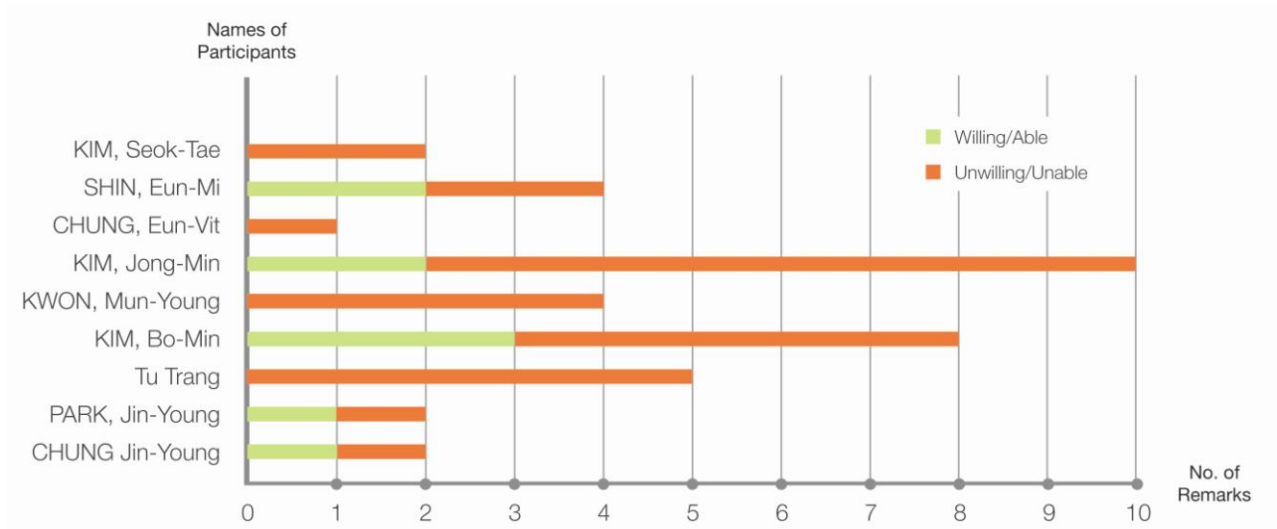Table 5.4 Willingness/Ability to Adopt Strategy-led Design Process (Korean)

Fig. 5.4 Participants′ Attitude to and Ability for Adopting Strategy-led Design Process (Korean)

A possible reason why the Korean students found the critical stage of linking strategies to design concept difficult is due to the fact that they were subject to a severe distraction at this stage. The source of the distraction came from having to prepare for the 20th anniversary of the department. This meant that there was a severe lack of progress in the project for at least two weeks. This fact can be illustrated by Bo Min's remark that she tried to follow what was instructed by the professor, but it was difficult due to the lack of time available.

In conclusion, the reasons why no Korean student made remarks in the willing/able category without also making remarks in the unwilling/unable category to follow instructions were because:
1. some students pursued their usual familiar method;
2. in general, the communication channels with their tutor and the company were not actively used;
3. they had time limitation because of their school's 20th anniversary preparation.
More detailed explanation will be discussed in Chapter 6.

5.3. EFFECTS ON OUTCOME

In the British case, 9 students made statements to the effect that the new approach was helpful in designing for the product differentiation collaboration through 25 separate remarks. In contrast, 4 expressed that the exercise was not helpful though 4 separate remarks. Of these 4, 2 also said that the approach was helpful.

Participants	Helpful	Not Helpful
Broadbent	1	0
Emerson	0	1
Fern	1	0
Flifford	1	0
Gaudio	2	0
Mumm	2	0
Orme	1	1
Robinson	5	1
Saba	5	0
Tang	4	0
Burnett	0	1

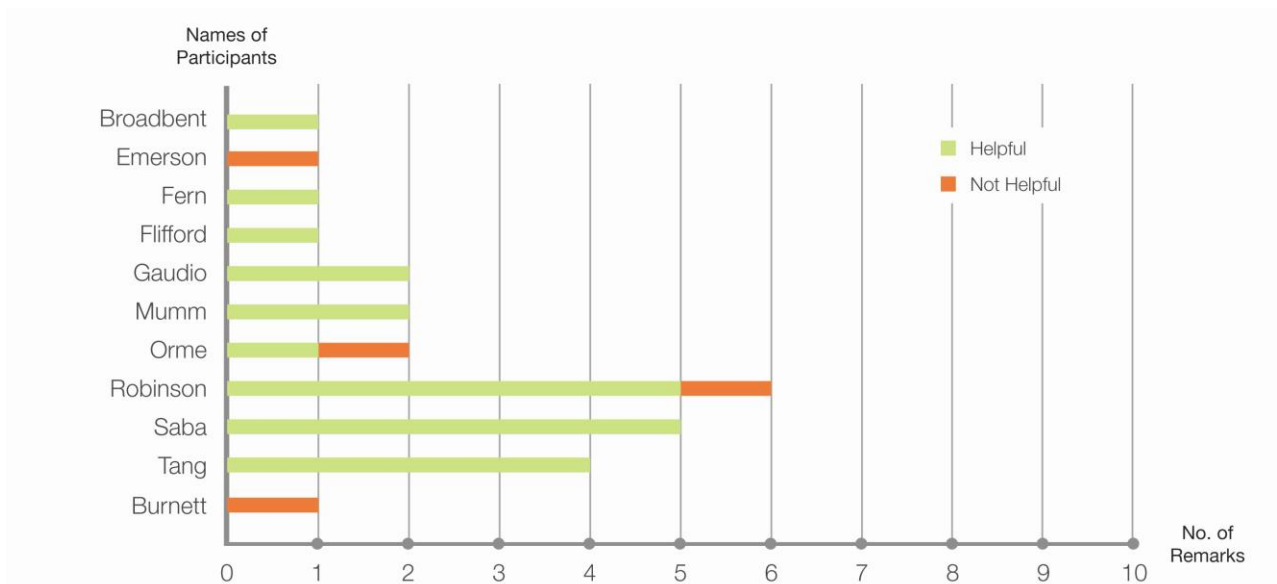Table 5.5 Effects of Strategy-led Design Process (Britain)

Fig. 5.5 How Participants Found Strategy-led Design Process for Collaboration Design Project (British)

In the Korean case, 8 students expressed that the approach was helpful through 25 remarks, and 8 students stated that it was unhelpful through 18 remarks. An interesting point is that 7 among them made conflicting responses. The reason appeared to be that most students agreed on the advantages of the strategy-led design process, but some felt that the execution was difficult and

not suitable for them. For example, Trang said, "It was a very logical way. There cannot be a protest against that. But I felt that it was too strict for my personality".

Participants	Helpful	Not Helpful
KIM, Seok-Tae	0	6
SHIN, Eun-Mi	8	2
CHUNG, Eun-Vit	3	1
KIM, Jong-Min	4	2
KWON, Mun-Young	1	2
KIM, Bo-Min	2	2
Tu Trang	1	1
PARK, Jin-Young	2	0
CHUNG Jin-Young	4	2

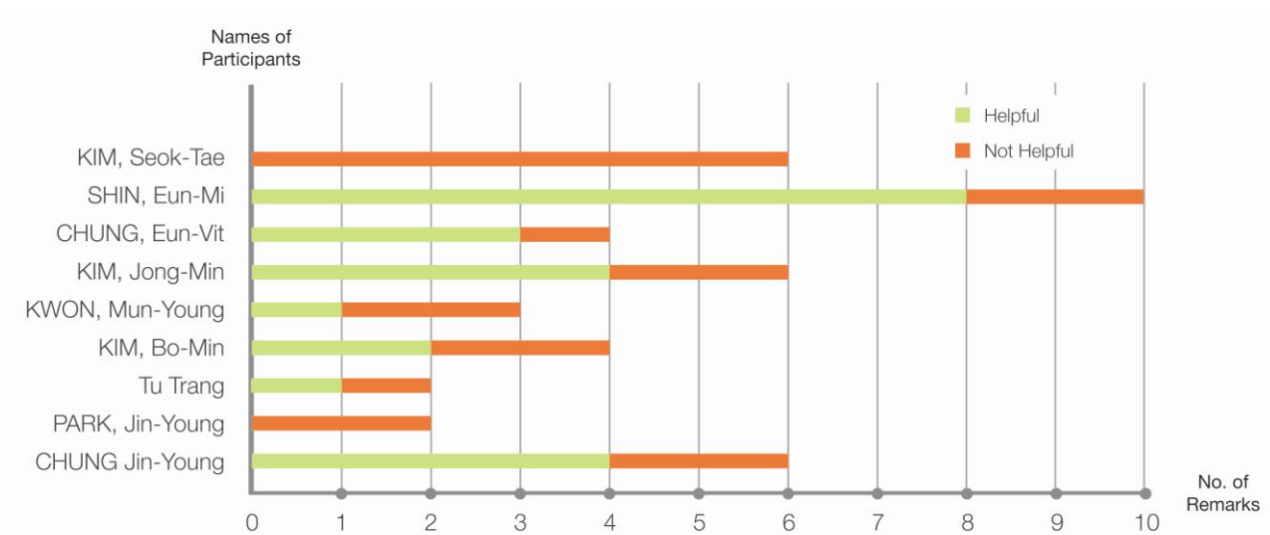Table 5.6 Effects of Strategy-led Design Process (Korean)

Fig. 5.6 How Participants Found Strategy-led Design Process for Collaboration Design Project (Korean)

6. CULTURAL ISSUES

6.1. PRIOR EDUCATION

As discussed in 5.1, the British and Korean students' understanding of the strategy-led design process were completely different. The reasons could be traced to their prior education.

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In the beginning of the project, the British students had difficulty in understanding the instructions themselves and following them. For all students, it was the first time that they attempted to make conscious efforts to develop design strategies for differentiating products based on their research. Despite the lack of systematic research, some students made an effort to understand and adopt the new design approach. This could be the reason why the British students were more successful in applying the research outcome to the design solutions than in the Korean case.

In contrast, the Korean students were already accustomed to what they thought to be similar to the strategy-led design process. In fact, what they were familiar with was not strategy-led process, but rather research-led design process without the missing element of strategy. The common elements of research in both approaches appeared natural to the students and made them think that they were the same, although they did not understand the terminology. They regarded themselves to be some kind of experts in design research such as usability test and design management in which they had a certain amount of training in class. Against this background, the Korean students did not get a fresh impression from the strategy-led design process unlike the British students. What was critical was that they could not distinguish the difference between their previous method and the strategy-led design process, either. They kept to their own process without opening their mind to the new instructions. As a result, they did not know what to do when it came to generating concrete concepts, despite the fact that they were offered a much more systematic and extended research process than the British.

The British students were more skilled in styling and developing concepts. In this situation, the strategic method helped them differentiate and generate better design solutions. However, the Korean students were already familiar with a structured research process, but they had little experience in developing ideas from research data. As such, the strategy-led design process was not as effective a tool for the Korean student as for the British.

6.2. CULTURAL CONDITIONING

As illustrated in 5.1.1, the British students had difficulty in understanding the new approach at first. However, they adopted it and developed their own strategies step by step without major confusion. Help was provided for this process through tutorials with the author. In contrast, the Korean students had more difficulty in narrowing down their strategies than the British counterparts. The research and the subsequent strategy-devising process was designed to begin with the general end of the spectrum and narrow down to the specific as it progressed. However, the students seemed to need more detailed instructions as it became more specific. The Korean students felt strained to reduce the scope for the subsequent step and to build more specific strategies. The students regarded the same-level strategies as having narrowed down from the previous stage.

This interesting phenomenon can be explained with the cultural theory by Masuda and Nisbett (2001). According to Masuda and Nisbett (2001), Asian people make an information structure considered with relationships and/or similarities among objects. However, the Westerners do it in a viewpoint of rules and categories. Reflecting upon Masuda and Nisbett's research, the Korean

students had difficulties in concentrating on specific strategies, because they tended to understand their tasks in terms of 'general'. This made making things specific challenging to the Korean students. This also made the professor give more specific instructions to the Korean students to follow.

The difference between the British and the Korean students in behavior and attitude due to their respective culture conditioning can be interpreted as below:

1. The British students seemed to think analytically, while the Korean holistically;
2. Among the Korean students, keeping face is regarded as an important value and the culture of participation is not well developed compared to the British students;
3. The Korean students hesitated to do an attention-grabbing behavior in a group. This propensity made communication difficult between students, professor and company.

1 is interpreted through Masuda and Nisbett's cultural theory, while 2 and 3 are supported by the politeness theory of Brown and Levinson(1987): to keep their positive face, the Korean students seemed to compromise and avoid challenging situations. The reasons why the Korean students were more passive than the British students and hesitated to express their own opinions can be explained with the same theory. Moreover they did their project in an arbitrary way rather than asking the professor and/or the collaborating company directly when they faced problems.

7. CONCLUSIONS: TOWARD A STRATEGIC ALLIANCE

7.1. COLLABORATION DESIGN

The three factors presented below were found to be influential for the design of industrial collaboration with an educational institution for a design project.

Task delegation:
As illustrated in 3.2, a careful handling of task delegation, if the project is to be delegated, is necessary. The need for, and what can be expected to be achieved through the collaboration need to be well-communicated to and clearly understood by the person in charge of the collaboration project. The ideal situation would be where the initiator and executor are the same, but this may not be practical in a large corporation where task mapping and command structure can be complex. If delegation is needed, the project manager should be appointed before the first meeting, and had discussed the matter with the initiator of the collaboration. He/she should also be present at the first meeting to avoid possible complications in communication during the post-initiation delegation process.

Goal setting:
The alignment of the goal of the collaboration project from the educational point of view may be necessary. Further, what could be realistically achieved with students must be clearly stated.

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Communication channels:
Not only is communication between the organization and university in the form of progress reports necessary, but a system for constant and informal communication between the project manager and researchers both within the university and the organization as well as for cross-channel communication need to be in place before the commencement of the project.

7.2. EFFECT OF PROPOSED METHOD

In the British case, the effect of the proposed method was what the participants found the most positive. The predominant response was that the strategic method for product differentiation was 'helpful'. The positive remarks were largely to the effect that the strategic method helped them differentiate and generate better results. Some said that they would use the method for their degree project. The negative remarks were largely to the effect that the method was difficult and time-consuming.

In the Korean case, the effect of the proposed method was positive as a whole. However, it did not seem as effective as in the British case in which the respondents found the method overwhelmingly positive. In the Korean case most students were not satisfied with their outcomes because the outcomes were deviated from the strategic process. The findings suggest that the reasons for the dissatisfaction were that;
- some Korean students did not grasp the difference between the new approach and the usual research-based process which they ultimately followed;
- they were unskilled in and not familiar with developing design concepts from their research;
- they were distracted at the critical stage of concept development with departmental affairs.

Those who expressed conflicting remarks thought that the method was not suitable for finding new form-factors, but indeed it was helpful as a guideline.

7.3. CULTURE-FRIENDLY PEDAGOGY:

Prior education had a detrimental effect on the perception and attitude of the Korean students. It caused confusion among students arising from the similarity between the research-based design process and the strategy-led design process as well as from the students' inability to understand the difference. Due to this reason, little difference seems to have been found in the quality of the design proposals in the expected standards of the British and Korean students, despite: 1) the more logical and efficient design research process used in the Korean design project, 2) the seniority of the Korean students over the British counterparts (post-graduates vs. undergraduates).

However, it must be pointed out that the British students were subject to better training in the traditional design skills than the Koreans. What lacked in the British students was prior

education in research-based process. The greatest difficulty that the British students faced was understanding the new approach due to its being new.

Therefore, prior education should be considered in developing culture-friendly pedagogy for collaborative design projects. Some suggestions:

1. Presence of prior education:
   A. Emphasizing the purpose of the pedagogy and highlighting the difference from the prior education would be an effective method for overcoming the barrier of the confusion from prior education.
   B. Giving emphasis to the transition phase between strategy and concept development.
   C. Designing collaboration so that the output of the project is concentrated toward research and strategy development.
2. Absence of prior education:
   A. Easier pedagogic delivery.
   B. More consideration for the teething process for research.

The findings suggest that cultural conditioning also plays an important role in the process of collaborative design projects. This was much more apparent in the Korean case:

The holistic way of thinking made 'narrowing down' of research data and strategies difficult for the Korean students.
Suggestion: use more detailed and specific guidance to encourage specific thinking, ex) template-filling, showing many examples and cases.

The need to save face and the fear of embarrassment prevented active communication and participation from students
Suggestion: more frequent individual tutorial sessions, setting targets for regular communication with the company.

This comparative study revealed many valuable insights – cultural issues among others. These issues would not have been discovered if the collaborations were studied separately. Far beyond simple comparisons and finding interesting contrasts, each case acted as a probe to reveal hidden insights from each other.

Using these insights wisely would make it possible to enhance the employability and professionalization of students by providing them with both education and professional experience with design collaboration with industry.

The research discussed various issues and possible framework for building a successful alliance between university and industry for design collaboration.

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