



Creative Industries Research
global perspectives

The Danish Design Industry Annual Mapping 2005

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May 2005**

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Preface

The present report is part of a series of mappings of Danish creative industries. It has been conducted by staff of the international research network, the Danish Research Unit for Industrial Dynamics, (www.druid.dk), as part of the activities of *IMAGINE.. Creative Industries Research* at the Copenhagen Business School (www.cbs.dk/imagine).

In order to assess the future potential as well as problems of the industries, a series of workshops was held in November 2004 with key representatives from the creative industries covered. We wish to thank all those who gave generously of their time when preparing this report. Special thanks go to Nicolai Sebastian Richter-Friis, Architect, Lundgaard & Tranberg; Lise Vejse Klint, Chairman of the Board, Danish Designers; Steinar Amland, Director, Danish Designers; Jan Chul Hansen, Designer, Samsøe & Samsøe; and Tom Rossau, Director and Designer, Ichinen. Numerous issues were discussed including, among others, market opportunities, new technologies, and significant current barriers to growth. Special emphasis was placed on identifying bottlenecks related to finance and capital markets, education and skill endowments, labour market dynamics, organizational arrangements and inter-firm interactions.

The first version of the report was drafted by Tina Brandt Husman and Mark Lorenzen, the Danish Research Unit for Industrial Dynamics (DRUID) and Department of Industrial Economics and Strategy, Copenhagen Business School, during the autumn of 2004 and finalized for publication by Julie Vig Albertsen, who has done sterling work as project leader for the entire mapping project. The empirical work behind the report has partly been funded by the Nordic Design Industry project, *The Future in Design*. Together with similar mappings of a variety of Danish creative industries and summaries of the workshops held, the report constitutes part of the underpinning for the associated policy memo and for subsequent work within *IMAGINE..*

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Executive Summary

- Danish design activities are carried out by in-house designers employed in manufacturing and service firms as well as by specialized design firms, i.e. the *design industry*. The current mapping focuses on the latter firms — employing, loosely estimated, half of all Danish designers, and defined statistically as architectural design (NACE 742040), interior design (NACE 748710) and industrial design (NACE 748720).
- The number of firms has grown significantly, from 5,458 in 2000 to 6,232 in 2003. Entrepreneurship is high, with a start-up rate relative to the number of incumbent firms of 10.8 per cent in 2000, compared to the national average of 4.8 per cent.
- Employment has grown from 8,405 in 1997 to 10,369 in 2001.
- The use of design by Danish industry has grown from 27% of all firms in 1997 to 36% of all firms in 2003.
- Turnover has increased from EUR 362.4 million in 1992 to EUR 591.4 million in 2001. Similarly, exports have increased from EUR 51.5 million in 1992 to EUR 75.1 million in 2001.
- Most firms are very small and one-person firms abound. Even though most firms claim that they lack size and commercial competence, horizontal networking is very rare.
- The most important areas of activity are graphic design (32% of Danish design firms state this as their primary activity); industrial design (26%); fashion and textile design (13%); interior design (11%); and furniture design (9%).
- Denmark was one of the first European countries to formulate a targeted policy for the Design industry. Some of this policy has since been abolished, but the industry still enjoys policy attention. A range of mapping initiatives and whitepapers have been produced, along with the establishment and/or restructuring of incumbent organizations providing knowledge, industry services and export promotion, notably the Danish Design Centre and the Centre for Research in Design. A range of high-profile branding events and conferences, such as INDEX, and the World Congress of Designers, are also publicly sponsored.
- The programmes offered by Denmark's high-level design schools are also undergoing changes towards providing more generic design skills, and a range of programmes at other educational institutions (such as universities) now include

courses combining craft skills with commercial skills. While many industrialists endorse this development as necessary, others criticize it, maintaining that craft skills rather than generic design or commercial skills should continue to be the basis of the industry's future competitiveness.

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1 The Danish design industry

The design industry in Denmark, as in other countries, is very small, representing approximately 1 per cent of all Danish industry, and like many service industries it has modest export rates. However, its economic impacts are not restricted to its own turnover and employment, as it also functions as a supplier to the manufacturing, ICT and tourism industries, adding significantly to their product values and competitiveness.

The case of the Danish design industry is particularly interesting for several reasons. It exemplifies how, due to designers' high level of education and close collaboration with certain manufacturing firms, a small advanced country can build a strong early-mover design industry, supporting high export rates of a range of selected design products. In addition, it exemplifies how, if no *strategic*, long-term efforts at industrial restructuring and public purchasing and skill provision are undertaken, this advantage may decline over time in an economy with only modest local demand for design products and little tradition for using design inputs in manufacturing for other than a few select products. Today, after years of declining performance, the Danish design industry is at a crossroads, with significant organic restructuring of the industry and a range of public policy initiatives underway. The next few years will demonstrate whether it is possible to regain some of Denmark's strength within the design industry through such efforts.

A central issue in restructuring both industry and public policy is how publicly provided skills correspond to current developments in the design industry's different activity areas. More specifically, the issue under current debate is how, in what combinations, and at what educational institutions the public should provide *craft* skills (technical skills related to aesthetics and form within a range of specialty areas) vs. *generic design* skills (research-based skills related to method, coordination and use of design, spanning all design areas) or *commercial* skills (managerial and marketing-related skills).

2 Definitions and data sources

A survey (National Agency for Enterprise and Construction, 2003a) has shown that the *use* of design (i.e. both design carried out by in-house designers and design purchased from suppliers in the design industry) is rapidly growing in Danish industry. This has led to an increase in the number of Danish firms using design, from 27% in 1997 to 36% in 2003 (National Agency for Enterprise and Construction, 2003b).

We shall concentrate on design *as an industry*, i.e. excluding in-house design activities internal to firms with other core products than design. Dedicated design firms (i.e. firms supplying business-to-business design services) encompass architectural design (NACE 742040), interior design (NACE 748710) and industrial design (NACE 748720). Many of these firms also undertake e.g. fashion and textile design or furniture design, which are not distinguished between in the available statistics. It should be noted that it has not been possible to statistically capture some of the firms providing e.g. web design and graphic design, as these business-to-business services are often offered by firms in e.g. the advertising industry.

Statistical data have been obtained from Statistics Denmark, except where otherwise noted (see also list of references). Primary sources also encompass 10 qualitative in-depth interviews with industrialists and key informants in the Danish design industry.

3 Industry performance

It is clear that Denmark's traditional role as an internationally recognised stronghold for design has been eroded over the last decades. As international prizes and attention increasingly go to Finland or Sweden as often as Denmark, the design industry in Denmark has begun to experience stagnating turnover and exports. Both within architecture, interior and industrial design turnover and exports have increased.

3.1 Turnover

Tables 1.1a through 1.1b indicate the development in annual turnover in private sector firms belonging to the design industries (as defined in section 2 above). Turnover for interior and industrial design in Denmark is small, but increasing. In the period 1992-1995, it increased by more than 100 percentage points. This was followed by a more moderate increase in 1995-1997, which in turn was followed by another growth period up until 2001 to four times the 1992 level for design, and double the 1992 level for architecture. For architecture, this means that the turnover growth (index 205.1) is greater than the Danish industrial average (index 160.3).

Table 1.1a: Turnover for selected years in design industries compared to turnover in general in Denmark (Million EUR) (Excl. VAT)

	Design Turnover*	Total Danish turnover	Design as per cent of total Danish turnover	Design turnover growth indexed (1999=100)	Total Danish turnover growth indexed (1999=100)
1992	57.5	198,155.7	0.03%	100.0	100.0
1995	115.2	223,137.9	0.05%	200.3	112.6
1997	155.2	247,534.6	0.06%	269.9	124.9
1999	214.7	260,921.7	0.08%	376.7	131.7
2001	265.6	317,680.1	0.08%	461.9	160.3

Source: Statistics Denmark, Enterprise Statistics from 1992 to 1999, replaced by General Enterprise Statistics after 1999¹. Due to the change in reporting methods total figures embrace the Danish private sector industries up until 1999 and all sector industries in 2001.

*Design is here total for interior and industrial design.

Note: Exchange rate of 01.07.2004 of DKK 1 = EUR 0.13460.

Table 1.1b: Turnover for selected years in design industries compared to turnover in general in Denmark (Million EUR) (Excl. VAT)

	Architecture turnover	Total Danish turnover	Architecture as per cent of total Danish turnover	Architecture turnover growth indexed (1999=100)	Total Danish turnover growth indexed (1999=100)
1992	304.9	198,155.7	0.15%	100.0	100.0
1995	410.9	223,137.9	0.18%	134.8	112.6
1997	478.8	247,534.6	0.19%	157.0	124.9
1999	503.4	260,921.7	0.19%	165.1	131.7
2001	625.8	317,680.1	0.20%	205.2	160.3

Source: Statistics Denmark. For 1992 to 1999 the source is Enterprise Statistics; after 1999 it is General Enterprise Statistics. See Footnote 1.

Note: Exchange rate of 01.07.2004 of DKK 1= EUR 0.13460.

¹ *General Enterprise Statistics* in 1999 replaced the former *Enterprise Statistics* produced for the years 1992-1999. The difference is in which firms, industries and sectors are comprised. The former Enterprise Statistics only contain economic and employment information concerning the private sector enterprises registered as compulsory to pay value added tax (VAT), whereas the General Enterprise Statistics embrace all activities and sectors. Moreover, General Enterprise Statistics only cover real active enterprises, where the former Enterprise Statistics up to 1999 covered all VAT paying enterprises in the private sector, if they were engaged in even the smallest activity. Active companies include companies that have at least a turnover corresponding to 0.5 full-time equivalent employment registered. Consequently, active enterprises covered for example in 2000 only 284,000 enterprises of the total of 521,000 registered enterprises. This means in principle that only approximately 1 per cent of the VAT turnover is covered. All in all, this makes up a considerable change in report methods of Statistics Denmark with two major consequences following. First, it obstructs the continuity in enterprise statistics when the period reported starts before 1999. Second, one could expect that the criteria of 'active enterprises' will rule out several of the smaller one-man operations such as freelancers especially predominant in creative industries (Statistics Denmark, *Declarations of content: General enterprise statistics*).

3.2 Exports

Despite increasing turnover in the period 1999-2001, exports of interior and industrial design decreased at the same time as total Danish exports increased. For architecture however, exports increased during the same period. Tables 1.2a and 1.2b demonstrate this.

Table 1.2a: Exports 1999 to 2001 of design (Million EUR)

	Design exports*	Total Danish exports	Design as per cent of total Danish exports	Design exports growth indexed (1999=100)	Danish economy's export growth indexed (1999=100)
1999	36.0	47,126.5	0.07%	100.0	100.0
2000	35.0	54,644.2	0.06%	97.2	116.0
2001	48.9	56,844.4	0.09%	135.8	121.0

Source: Statistics Denmark.

*Design is here total for interior and industrial design.

Exchange rate of 31.12.01 of DKK 1= EUR 0.13391, 2000 of DKK 1= EUR 0.13404, and 1999 of DKK 1= EUR 0.13445.

Table 1.2b: Architecture exports 1999 to 2001 (Million EUR)

	Architecture exports	Total Danish exports	Architecture as per cent of total Danish exports	Architecture exports growth indexed (1999=100)	Danish economy's export growth indexed (1999=100)
1999	15.5	47,126.5	0.03%	100.0	100.0
2000	25.6	54,644.2	0.05%	165.2	116.0
2001	26.2	56,844.4	0.05%	169.0	121.0

Source: Statistics Denmark.

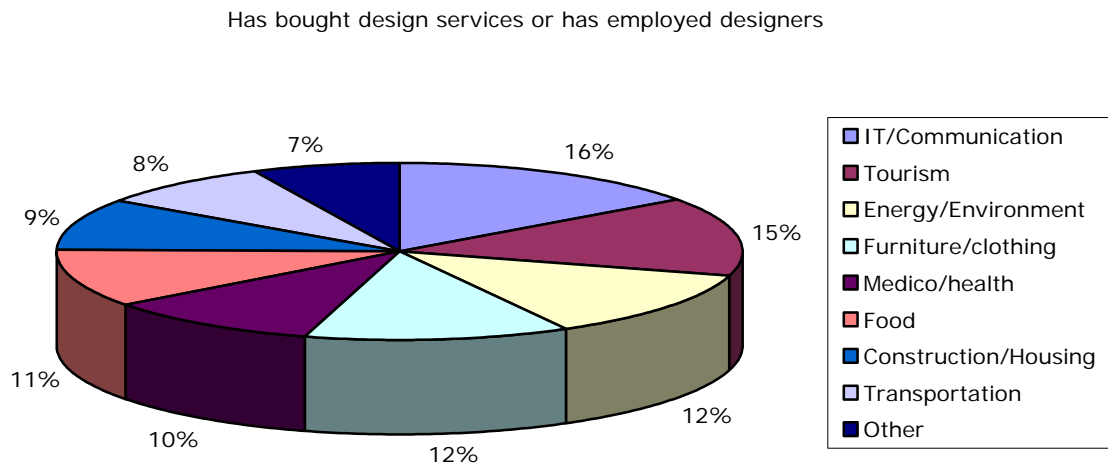
Exchange rate of 31.12.01 of DKK 1= EUR 0.13391, 2000 of DKK 1=EUR 0.13404, and 1999 of DKK 1=EUR 0.13445.

3.3 Domestic demand

The use of design (i.e. either in-house design activities or the purchase of specialized design services) by Danish firms is spread across many sectors. IT/communication and tourism industries have a particularly extensive use of design (National Agency for Enterprise and Construction, 2003b). Figure 1.1 shows the split of demand use across different sectors.²

² This figure also includes internal employment of designers.

Figure 1.1: Business profile of buyers of design



Source: National Agency for Enterprise and Construction, 2003b

4 Industry structure

While performance in terms of turnover and exports still lags behind, the Danish design industry is undergoing rapid development, with organic changes in industry structure.

4.1 Number of firms

Tables 1.3a and b demonstrate a noteworthy increase in the number of companies providing interior and industrial design in Denmark and a simultaneous decrease in the number of architectural companies in the period. Compared to the total number of firms in Denmark, the design industry is clearly also experiencing growth measured in number of firms.

The large increase in the number of firms indicates a high level of entrepreneurship. The start-up rate relative to the number of incumbent firms was 10.8 per cent in 2000, especially marked by the design industry, compared to 4.8 per cent for Danish industry in general (The Ministry of Culture and the Ministry of Trade and Industry, 2000).

Table 1.3a: Number of design firms in selected years compared to number of firms in general in Denmark

	Design firms*	Total number of private sector firms (legally independent entities)	Design as per cent of total Danish firms	Growth of design firms indexed (1999=100)	Growth of Total Danish firms indexed (1999=100)
1992	237	342,431	0.07%	100.0	100.0
1995	1,357	328,634	0.41%	572.6	96.0
1997	1,946	325,854	0.60%	821.1	95.2
1999	2,598	326,820	0.79%	1,096.2	95.4
2001	2,860	284,166	1.01%	1,206.8	83.0

Source: Statistics Denmark

*Design is here total for interior and industrial design

For 1992 to 1999, the source is company statistics; after 1999 it is general company statistics. See Footnote 1.

Table 1.3b: Number of architectural firms in selected years compared to number of firms in general in Denmark

	Architecture firms	Total Danish firms (legally independent entities)	Architecture as per cent of total Danish firms	Growth of architecture firms indexed (1999=100)	Growth in Total Danish firms indexed (1999=100)
1992	3,360	342,431	0.98%	100.0	100.0
1995	3,043	328,634	0.93%	90.6	96.0
1997	2,959	325,854	0.91%	88.1	95.2
1999	2,995	326,820	0.92%	89.1	95.4
2001	2,811	284,166	0.99%	83.7	83.0

Source: Statistics Denmark

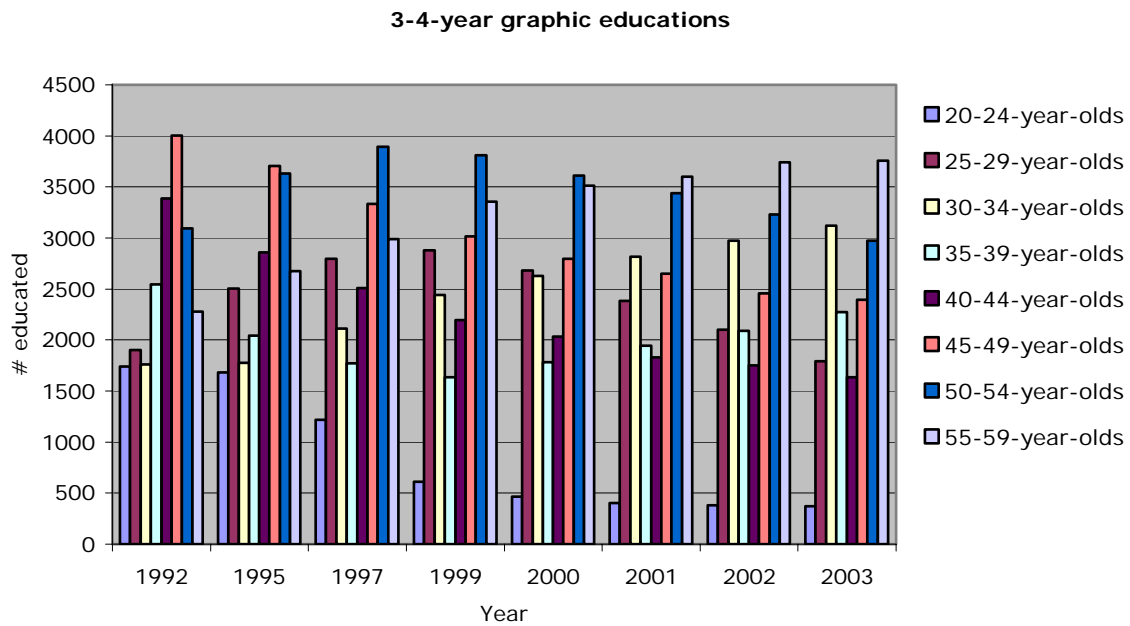
In 1992 to 1999 the source is company statistics, after 1999 it is general company statistics. See Footnote 1.

4.2 Education, employment and wage levels

Figures 1.2a to 1.2d indicate developments in the area of education for designers. It should be stressed that the four categories of educational programmes also comprise some people without a design education, although the majority of trained designers will be incorporated in these figures³. Figures 1.2a to 1.2d illustrate the fact that designers tend especially to have a graphic or short-cycle higher education. Figures 1.2a to 1.2d also illustrate the fact that it is especially younger people who possess a medium-cycle higher design education.

³ The exact definitions of the educational programmes comprised by the four different categories are available from Statistics Denmark. All handicraft/artistic design programmes from the Danish design schools are included; however, some dance- and music related programmes are also included, as are some photography programmes. The categories are labeled in accordance with the typologies used by the Ministry of Education and reflect the Danish higher education structure comprising the 2-year short-cycle higher education programmes, the 3-4½-year medium-cycle higher education programmes, and the 5-6-year long-cycle higher education programmes.

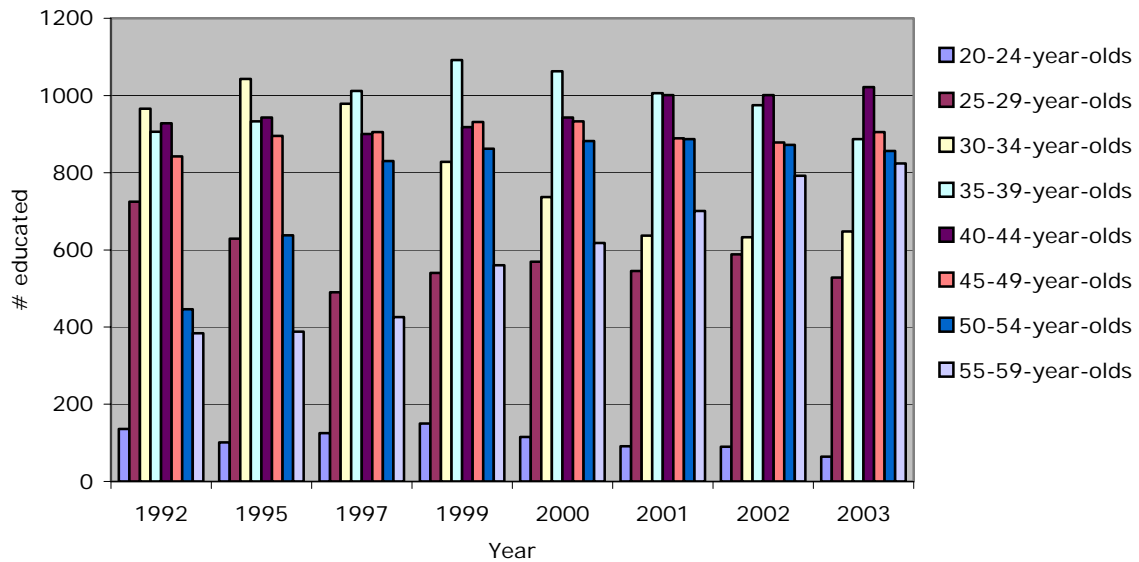
Figure 1.2a: Education in the Danish design industries (number of students by age attaining a graphic education as the highest-level education 1992-2003)



Source: Statistics Denmark.

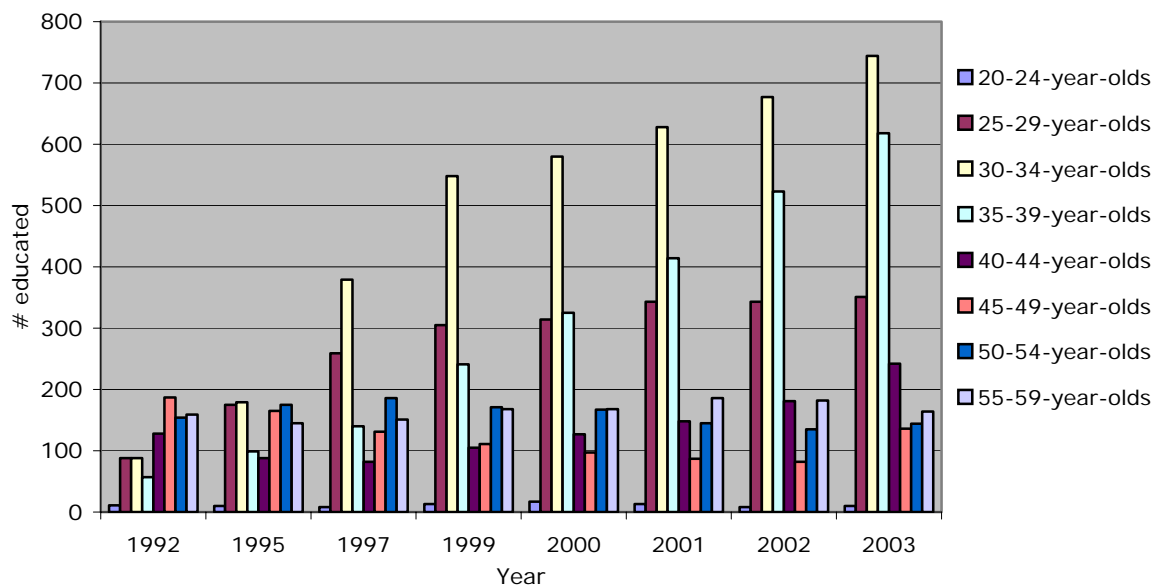
Note: Graphic educations belong to the group of 3 to 4 year higher education programmes at a level corresponding to a university Bachelor's programme, however awarded with a diploma and not a Bachelor's Degree. These "medium cycle higher education programmes" usually prepare students for a profession, such as for example artistic programmes, teacher training programmes, programmes in social work, journalism, nursing, engineering etc. These programmes include periods of practical studies (cf. Ministry of Education, <http://eng.uvm.dk/publications/factsheets/fact7.htm>).

Figure 1.2b: Education in the Danish Design industries (number of students by age attaining an artistic short-cycle higher education as the highest-level education 1992-2003)



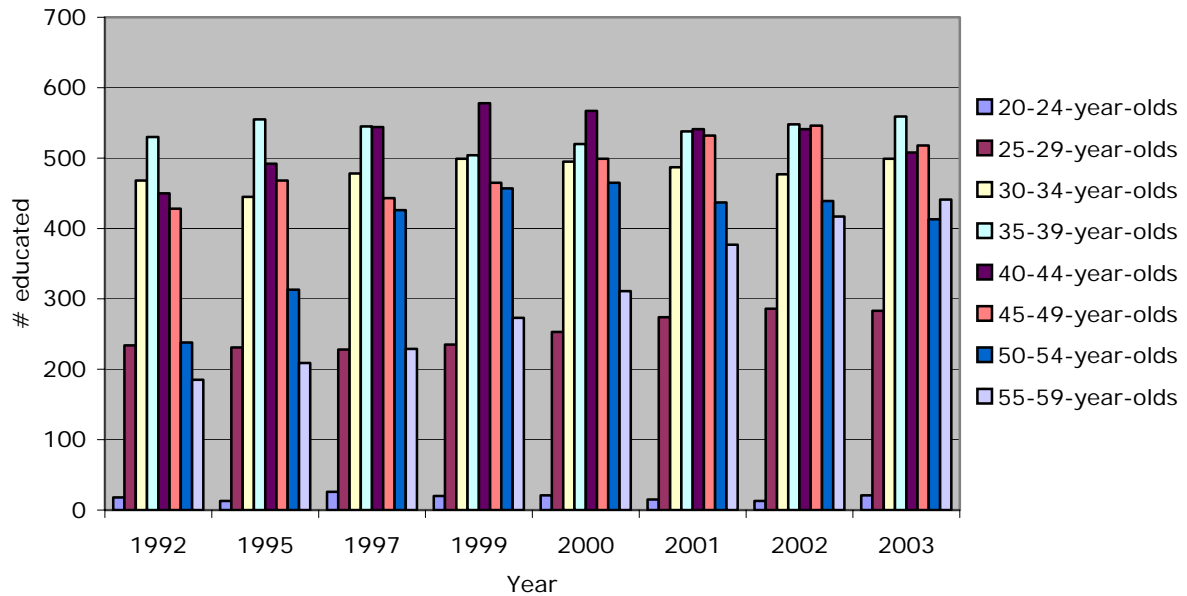
Source: Statistics Denmark.

Figure 1.2c: Education in the Danish design industries (number of students by age attaining an artistic medium-cycle higher education as the highest-level education 1992-2003)



Source: Statistics Denmark.

Figure 1.2d: Education in the Danish design industries (number of students by age attaining an artistic Bachelor education as the highest-level education 1992-2003)

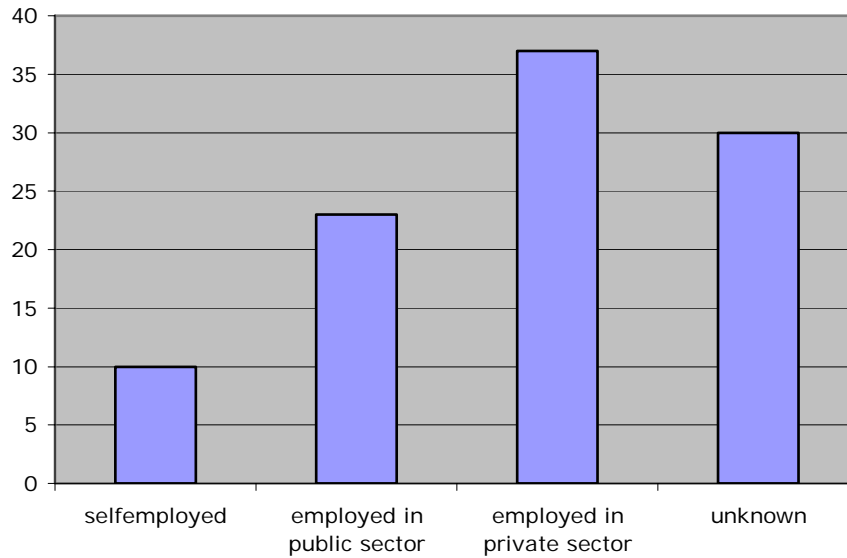


Source: Statistics Denmark.

As mentioned above, many trained designers are employed outside the design industry. In particular, design-intensive manufacturing or service firms (such as consumer goods manufacturers or advertising and communication firms) choose to employ in-house designers, often in combination with purchasing design services from design firms. Danish design-intensive firms outside the design industry encompass Novo Nordisk, DSB, Bang & Olufsen, and a range of fashion houses. There are no available figures on the exact split between trained designers working in the design industry as opposed to in-house designers in other industries.

However, figures from the largest Danish educational institution for designers, which is located in Kolding, *Designskolen Kolding* (see below), show that of its 222 graduates from 1997-2001, 23% are working in the public sector alone. A very conservative estimate that a third of those employed in private firms are employed outside the design industry means that more than 50% of graduates work outside the design industry. See Figure 1.3.

Figure 1.3: Graduated designers by type of employment 1997-2001.



Source: Statistics Denmark.

Note: The figures show the distribution by type of employment 2002 of students who graduated from Designskolen Kolding 1997-2001.

Table 1.4 shows the total number of employees, while Table 1.5 illustrates the distribution of employees according to different firm sizes.⁴ Table 1.4 clearly shows that interior and industrial design as well as architecture experienced an increase in the number of full-time employees in the period 1993-2001. The growth is particularly noteworthy for industrial design. Table 1.6 gives a vague indication of the wage level in the design industry. Numbers are only available for 2001 and 2002. The table includes gross profit and turnover per employee for the purpose of comparison only. It is clear that in all three industries constituting the design industry, the average wage level for employees increased in 2001-2002. However, this should, of course, be viewed in relation to the general increase in Danish wage levels during the same period.

Table 1.4 Designers employed by type of design occupation, 1993-2001.

	1993	1995	1997	1999	2001
Architect	5,387	6,073	6,598	6,778	7,523
Interior	179	257	255	302	325
Industrial Design	854	1,193	1,552	2,074	2,521

Source: Statistics Denmark, Company Statistics

Note: Number of jobs at the close of November

⁴ The slight deviation in the number of employees in Table 1.4 compared to Table 1.5 is due to the different statistical registers used by Statistics Denmark.

Table 1.5 Number of firms and employees in selected years in Danish design industries

		1997	1999	2000	1997	1999	2000
	Firm Size	Firms	Firms	Firms	Employees	Employees	Employees
Architect	size 0	2,467	2,125	2,126	2,467	2,125	2,126
	size 1-4	416	506	555	760	934	932
	size 5-9	107	137	108	721	919	718
	size 10-19	60	55	64	784	707	808
	size 20-49	19	33	29	569	941	886
	size 50-99	10	7	7	704	456	527
	size 100-199	3	4	4	326	470	526
	size 200-499	0	0	0	0	0	0
	size 500+	0	0	0	0	0	0
Interior	size 0	160	174	191	160	174	191
	size 1-4	19	23	28	34	41	38
	size 5-9	3	4	4	18	26	24
	size 10-19	3	4	4	45	58	60
	size 20-49	1	1	1	26	21	21
	size 50-99	0	0	0	0	0	0
	size 100-199	0	0	0	0	0	0
	size 200-499	0	0	0	0	0	0
	size 500+	0	0	0	0	0	0
Industrial design	size 0	1,570	1,866	2,114	1,570	1,866	2,114
	size 1-4	139	215	264	222	359	397
	size 5-9	23	34	30	144	227	200
	size 10-19	7	14	13	91	186	163
	size 20-49	4	4	5	120	116	159
	size 50-99	0	0	0	0	0	0
	size 100-199	0	0	0	0	0	0
	size 200-499	0	0	0	0	0	0
	size 500+	0	0	0	0	0	0

Source: Statistics Denmark

Note: Number of jobs at the close of November, number of firms are from the Central Register of Business (CVR)

Zero indicates that the observation is missing, or that Statistics Denmark has omitted the observation for reasons of discretion or too much uncertainty about the observation.

Table 1.6 Salary per employee, incl. gross profit, and turnover per employee in design and architectural production (in EUR)

		2001	2002
Architecture	Turnover per employee (EUR 1,000), average	100.57	109.50
	Salary per employee (EUR 1,000), average	51.28	53.87
Indoor Inter	Turnover per employee (EUR 1,000), average	206.63	240.55
	Salary per employee (EUR 1,000), average	44.19	47.81
Industrial Design	Turnover per employee (EUR 1,000), average	110.34	119.47
	Salary per employee (EUR 1,000), average	44.19	47.27

Source: Statistics Denmark, Financial account statistics (numbers only available for 2001 and 2002)⁵
Exchange rate of 31.12 each year: 2002 of DKK 1= EUR 0.13468 and 2001 of DKK 1= EUR 0.13391

4.3 Firm sizes

Table 1.5 shows employment split up according to different firm sizes. The first columns in Table 1.5 also show how the number of firms is distributed between different firm sizes. For interior and industrial design companies, no firm employs 50 or more employees, and the majority of firms have no employees except for the owner him/herself. The abundance of one-person companies should of course be viewed in relation to the high level of entrepreneurship in the industry.

4.4 Geography and clustering

As is clear from Table 1.7 and Figure 1.4, the design industry is clustered in Copenhagen, and to a lesser extent, Aarhus. The bulk of companies are located in Copenhagen and Copenhagen County in particular, but also in Aarhus and Frederiksborg Counties and North Jutland County. This tendency is clear for interior and industrial design plus architecture, although Figure 1.4 also illustrates the fact that interior design companies seem to be slightly less clustered than industrial design and architecture companies.

The clustering of the industry has first and foremost to do with “urban economies” in the guise of labour markets and educational institutions (with Copenhagen and Aarhus as Denmark’s primary “creative” cities), rather than with “agglomeration economies” stemming from inter-firm networking. With customers using design firms regardless of their location, vertical relations to customers (value chains) cannot account for the clustering of firms (Ervhvervs- og Boligstyrelsen 2003). As discussed below, horizontal relations among design firms are generally so rare in Danish industry that this cannot account for the clustering of firms either.

⁵ The financial account statistics are based on standardized reporting from companies to the Ministry of Taxation and the Central Customs and Tax Administration, and on information based on questionnaires answered by the companies. The statistics have been accumulated over time. The system that had existed since 1986 was replaced in 1994 by a system that included the construction sector. In 1995 the industrial sector was added, in 1998, wholesale businesses, and in 1999 other private urban trade companies were included, too. As is the case with the general company statistics, only active companies have been included since 1999, implying a reduction in the number of firms and workplaces, and to some extent a reduction in the number of employees. The financial accounts, however, are largely unaffected. Finally, starting in 2000, the calculation method has been changed for companies with only one full-time employee.

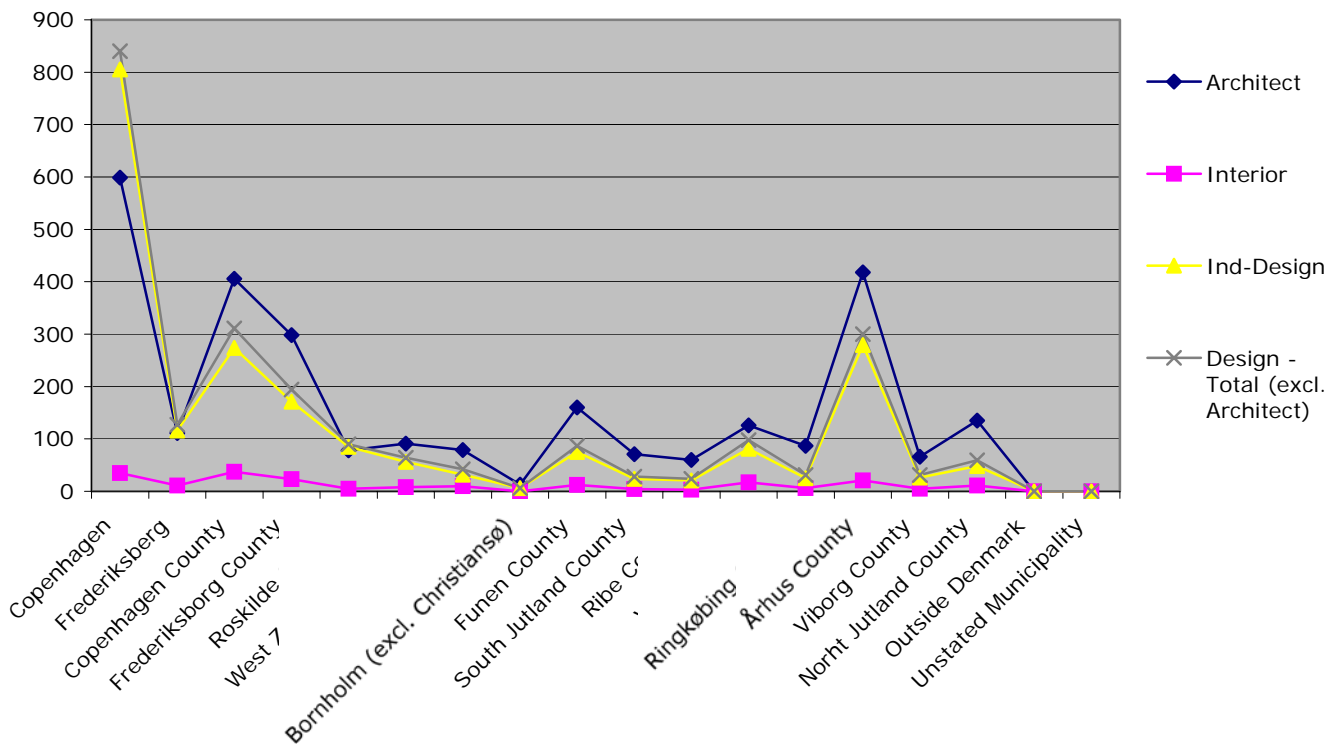
Table 1.7: Geographical location in Denmark of Danish design companies (excl. architectural production)

Total design (excl. architecture)	1992	1993	1994	1995	1996	1997	1998	1999
Copenhagen	77	265	333	407	467	612	705	840
Frederiksberg	10	37	44	57	73	96	98	127
Copenhagen County	34	141	157	192	214	253	276	311
Frederiksborg County	25	98	98	112	135	143	166	194
Roskilde County	9	23	33	35	42	53	69	90
West Zealand County	7	20	31	37	38	45	59	64
Storstrøms County	4	17	22	20	25	32	41	42
Bornholm (excl. Christiansø)	0	1	1	1	2	5	8	6
Funen County	9	41	46	55	58	74	82	87
South Jutland County	5	13	16	18	23	32	30	28
Ribe County	0	10	10	15	18	22	22	24
Vejle County	8	38	43	47	54	73	96	98
Ringkøbing County	3	17	21	25	26	29	26	31
Århus County	21	88	106	132	160	227	278	300
Viborg County	5	19	18	21	24	25	29	31
North Jutland County	9	33	44	48	49	46	50	59
Outside Denmark	0	0	0	0	0	0	0	0
Unstated Municipality	0	0	0	0	0	0	0	0

Source: Statistics Denmark, VAT statistics

Note: The numbers are registered SE entities at the close of the different years.

Figure 1.4: Geographical location in Denmark of Danish design companies incl. architectural production (in 1999)



Source: Statistics Denmark, VAT statistics. Note: The numbers are registered SE entities at the close of the different years.

4.5 Activity areas

The activities of the Danish design industry encompass graphic design; industrial design; fashion and textile design; interior design; furniture design; web design; technical design; design planning and management; and experience design. The bulk of the activities fall within five main areas: graphic design (according to National Agency for Enterprise and Construction (2003b) 32% of the Danish design firms state this as their primary activity); industrial design (26%); fashion and textile design (13%); interior design (11%); and furniture design (9%).

Firms in all activity areas are generally characterized by very small firm sizes, low professionalization and few commercial skills, a lack of horizontal networks and strategic alliances, and modest export rates. However, there are significant differences in how firms in different activity areas operate in terms of how narrowly specialized and how actively engaged in networking they are, and hence, which skills they use.

Notably, fashion and textile design, furniture design, and, to a lesser extent graphic design stand out as being highly focused upon craft skills. However, they are very different in terms of economic success and growth:

- *Fashion and Textile Design* (13% of firms state this as their primary activity area) is the most dynamic and growing activity area in the industry. However, this activity area is also characterized by strong specialization and vertical (customer) networking only. There is a complete lack of networking with other design firms. This is further enhanced by the very specialized craft skills these firms use. So far, firms in this segment have thrived on these craft skills, but the increasing success of export markets and subsequent growth of these firms mean that they may become insufficiently supplied with potential employees possessing both design skills and commercial skills in the near future.
- *Graphic Design* (the largest area of design, comprising 32% of firms. 65% of design customers purchase graphic design (National Agency for Enterprise and Construction 2003b)). With a strong focus upon craft skills but also lower export orientation, slower growth rates, and larger firm sizes (due to some maturity), the need for upgrading commercial skills in firms in this activity area is less critical. However, new technological developments in ICT make great demands on firms to upgrade craft and generic design skills.
- *Furniture Design* (7%) is a classic Danish design area in decline. The decline may be ascribed to a growing conservatism of furniture designers, but also to weak competencies in networking. Vertical relationships with customers are not systematically managed, and strategic horizontal networking with other design firms is virtually absent — first and foremost due to extremely small firm sizes (many consist of one single designer) and a consequent total absence of commercial skills. As a result, this activity area has experienced negative growth and negligible exports.

Firms specializing in industrial design and interior design typically incorporate both craft and commercial skills, but are also characterized by different development paths:

- *Industrial Design* (at 25% the second largest area in the industry) combines art and commerce, with strong vertical networking and both craft skills (technological developments in this area are not as rapid as in graphic design) and commercial skills, resulting in reasonable exports and growth. However, compared to industrial designers in e.g. Italy or the UK, these Danish firms are traditional in terms of their focus on designing only customers' products, rather than becoming involved in other stages of production. As a result of this product orientation, some firms in this area also mention that they lack capital, as they wish to venture into production of a design product themselves (National Agency for Enterprise and Construction 2003b).
- *Interior Design* (12%) is stagnating. This area suffers to an extent from the opposite skill problem from the other areas: Even though most interior design firms are less oriented towards exports, their main product is a package of combined products and design services from other firms, and consequently, interior design firms have always been relatively commercially oriented. However, ICT tools are now gaining ground in this activity area, necessitating an acute input of more specialized craft and generic design skills.

A noteworthy consequence of recent years' structural change within the Danish design industry is that the distribution of activities is also changing. While Denmark seems to be losing its traditional design strongholds on export markets such as furniture design, recent growth in terms of numbers of firms and employment takes place within newer design activities with modest export rates. However, fashion and textile design stands out as a special positive case.

Firm sizes continue to be small across activity areas (of course, partly as a result of high start-up rates), and firms in all areas lack strategic horizontal collaboration (National Agency for Enterprise and Construction, 2003b). However, the change of specialization in activity areas will impact on the future need for institutional infrastructure and public support. Most notably, whereas all firms depend upon public provision of skills and, as they are challenged by new technologies, need to ensure access to state-of-the-art artistic skills, the growth in the number of firms and export orientation in fashion and textile design as well as industrial design increase the need for publicly provided commercial skills. This will be discussed further in the following section.

5 Institutional infrastructure

5.1 Policy initiatives

A recent survey has shown that most Danish firms that use both in-house and purchased design have export more and have a higher level of growth than other Danish firms: design-using firms on average export 34% of their turnover, whereas other firms export 18%, and in the period 1998-2003, design-using firms on average grew 22% more than other firms (National Agency for Enterprise and Construction 2003a). However, at the same time, international observers point to the fact that while Danish design has been valuable and visible throughout the last 50 years, its international visibility is rapidly eroding.

These two observations have attracted Danish political attention, targeting the design industry as a strategic industry and bringing about a number of initiatives. In 1997, the government allocated EUR 13 million to increasing the use of design by Danish firms, in the guise of increased support to the activities of the Danish Design Centre (see below), and a highly praised “Icebreaker” policy of co-funding up to EUR 8,500 of Danish firms’ new design investments. Denmark was hence, quite extraordinarily, one of the first European countries to apply targeted policies to the Design industry. The new government, which came into power in 2001, has since removed many of these initiatives, including the “Icebreaker” policy. However, publicly funded branding and education activities are still carried out, and the government has also been relatively successful in mustering private partners for some of them. New design institutions have been created and incumbent ones have been changed, and both one-off and recurring prizes and events have been planned in an attempt to promote and brand the Danish design industry. Below, branding activities are dealt with first, before educational institutions and other organizations are discussed.

Public initiatives to internationally brand the Danish design industry through prizes and events mostly benefit firms within activity areas with high levels of exports, but may, of course boost exports for the industry in general. Notable activities of this kind include:

- *The INDEX: conferences.* Starting with INDEX: 2005, INDEX: is expected to become a very high-profile and recurring series of events, spanning several months each time in Copenhagen and encompassing exhibitions, fairs, international seminars, and an international conference with prizes. Boasting a distinguished international advisory board and employing international top designers and planners, INDEX: 2005, in September-November 2005 has the theme “Design to Improve Life”. The aim is to encourage designers to spur public debate, by asking them to visualize four future scenarios imagined by a panel of planners, to set up a think tank with both designers

and other creative people in order to suggest solutions to future community problems, and finally to award five EUR 100,000 prizes to projects that improve the quality of life within selected areas of human life. The bulk of funding comes from the Ministry of Economic Affairs and Industry and the City of Copenhagen (together providing approx. EUR 1.6 million), but a range of well-known private funds and design-using companies will sponsor the event in 2005 (due to their limited size, no design firms will act as sponsors).

- *Other conferences.* The Danish Design Centre and private organizations related to design (see below) are currently organizing a range of minor conferences, and policymakers are trying to attract major international events to Denmark. Notably, in 2005, the World Congress of Designers entitled “ERA: The Changing Role and Challenges of Design” is to be held in Copenhagen, with public support.

These events attract much attention and arouse little controversy. However, while these new events are being planned, a “quiet revolution” is underway within the institutional set-up of the industry, in the workings of public and semi-public organizations, and first and foremost, in educational institutions. The most important of these institutions and policy initiatives are discussed below.

5.2 Organizations

In light of increased public attention, more and more public and semi-public organizations are beginning to deal with the challenges of the Danish design industry. For example, industry mappings and whitepapers are being published by the Ministry of Culture, the Ministry of Economic Affairs and Industry, the National Agency for Enterprise and Construction (which works with industrial policies under the Ministry of Economic Affairs and Industry), plus the newly established Centre for Research Design (see below). These publications have provoked public debate on the design industry to an all-time high level, to the general benefit of the entire design industry.

The new attention paid to the Danish design industry can also be traced in the workings of incumbent organizations of importance to the industry, as well as the establishment of new organizations with public support. The most important of these organizations are:

- *Danish Design Centre (DDC)*, established in 1978. DDC aims at encouraging increased use of design in Danish industry in general, and at promoting the Danish design industry at home and abroad. New government policies put DDC on centre stage for promoting the design industry, and seek to promote DDC as a national Knowledge Centre (with the special policy status this implies). Consequently, DDC is now an independent institution governed by the Ministry of Economic Affairs and Industry, with an annual budget of around EUR 4.5 million, of which approx. EUR 0.7 million are publicly funded (this represents a severe cut from the EUR 2.5 million granted in 2003 as a result of a change in government policies). DDC arranges shows and fairs in Denmark and abroad in order to promote and brand Danish design. Its high-profile and large-budgeted fairs and shows around the world attract international attention. On a lesser scale, DCC also runs a profitable shop and showground in downtown

Copenhagen. The Centre provides a range of direct support services for the design industry (on the behalf of the National Agency for Enterprise and Construction), disseminates information about new government support programmes for firms and educational initiatives, and stimulates collaboration between design firms and users, through newsletters, web tools, fairs, and networking activities. It should be noted that some counselling activities plus the Centre's involvement in the Icebreaker initiative have been closed down as a result of budget cuts. DDC also awards the annual high-profile Danish Design Award to an outstanding design solution within any area of design.

- *Centre for Research in Design*. Just opened in September 2004, this centre is a collaborative effort between the biggest design educational institutions under the Danish Ministry of Culture (Denmark's Design School, Designskolen Kolding, the School of Architecture, and Aarhus School of Architecture — see below for a description). Located in the School of Architecture in Copenhagen, the centre's goal is to boost scientific research in design in order to benefit teaching in all participating institutions, through coordinating ongoing research at the institutions but also by initiating new research. The Centre also aims at increasing the collaboration between the educational institutions and industry. At present, the Centre has a modest scientific staff of three (although the aim is to have 5-10 employees in total), and is publicly funded through the School of Architecture, with an annual budget of approx. EUR 2.7 million.
- *Danish Centre of Architecture (DAC)* is an information and development centre, aimed mainly at coordinating the activities of architects and other actors within Danish industry, to the benefit of both the Danish design industry and city planning. It is a private fund established by the construction industry and the private Council for Industry, funded in part by the state but with significant private sponsoring.
- *Association of Danish Designers*. Established in 1995 as a private association, the association now boasts more than 1000 independent members. The association represents Danish designers in the national debate and in international networks, runs newsletters, establishes contacts between designers and design-users (e.g. in Design Management Forum), and provides web services (e.g. www.desingforskning.net).
- *Other associations*. Few fashion and textile designers are members of the Association of Danish Designers, as some (but not all) are members of Danish Textile and Clothing (*Dansk Textil og Beklædning*) instead. Many architects are members of *The National Federation of Danish Architects* (which mostly provides information services). A range of more narrow industry associations (e.g. the *Association of Interior Designers*, associated with the above-mentioned Danish Designers) as well as small institutions sponsoring design and craft projects (such as *Danish Crafts*) also exist.

5.3 Education

Currently, the most interesting development in the infrastructure of the Danish design industry is the change in the area of education. Whereas some critics argue that this change at present only benefits design firms demanding more generic design skills or commercial skills, others claim that in the near future, this will mean that it will affect the entire Danish design industry.

The design industry is driven by the ability of design firms to achieve in-house high-level competencies while at the same time coordinating with customers — a classic challenge for most service industries. Rather than being ascribed to the *general* efficiency of such coordination within the Danish design industry, the early success of the industry is usually seen as being based on a range of *particularly* successful collaborative efforts between industrial firms and design firms. Contrary to the situation in some other countries, the core of the Danish design industry continues to be a high level of in-house competencies in design firms with strong craft elements, supported by designers' high level of education from the public system. Even though in-house competency creation and self-taught skills are important in the Danish design industry, design skills provided by public education are still central — for all activity areas of the industry. Today, 83% of Danish design firms (excluding architects) employ people who have obtained design training in the public education system in the provision of their core product, design (compared to 10% using engineers)(EBST, 2003).

Each year 250-300 new designers graduate in Denmark. The quality of design skills provided by Danish design educational institutions is generally perceived to be very high. Danish design programmes are traditionally divided into specialized craft areas, have relatively little user (industry) involvement, and provide students with few generic design skills and no commercial skills. This has served to support particular activity areas and firm types in the industry, where firms often solve given specialist tasks rather than being involved in their customers' planning or strategic activities. This is in contrast to, for example, Italy and the UK, where education in design is often project oriented, carried out in collaboration with customers, and aimed at providing students with both craft skills and general communication and managerial skills).

Rapid technological developments make it crucial that the input of craft skills to industry be upgraded. Furthermore, faced with a higher degree of international competition and therefore placing greater focus upon exports and new markets, many firms now desperately need to upgrade the commercial skills of their designers. Finally, if design firms are to supply industry with more complex and value-adding design services, future designers need to possess generic skills related to design methods, use, and coordination. Thus, future design education has to undertake a double or even triple role, improving craft skills and providing more generic design skills — as well as possibly also allowing students to supplement these skills with commercial skills. This challenge is currently being addressed by educational institutions. The most important Danish educational institutions related to the design industry are listed below.

Institutions with a current strong focus upon craft design skills encompass:

- *Denmark's Design School*. Under the Ministry of Culture. With a budget of DKK 66 million, a staff of 122 (95 teachers) and 465 students taking five-year Master's programmes within nine specialty craft areas (furniture and interior design, fashion, textiles, ceramics, glassware, industrial design, graphic design, production design, and digital design) this is Denmark's leading educational institution for the design industry. Located in Copenhagen. Up until now, the school has focused on proving very specialized, high-level, craft skills, but it is currently undergoing a politically induced change, with greater emphasis upon research-based generic design skills, resulting in budget and personnel changes. This change is being met with heavy protests from critics who claim that this undermines the craft-based competencies of the school.
- *Designskolen Kolding*, Kolding. Also under the Ministry of Culture and with 500 students taking five-year Master's programmes in six different specialties (graphic design, interactive media, textiles, fashion, industrial design, and ceramics) this is Denmark's second biggest educational institution related to design. Located in Kolding, Jutland.
- *The Royal Academy of Fine Arts, School of Architecture*. Located in Copenhagen and more than 250 years old, this is the truly classic educational institution, offering five-year Master's programmes in architecture in 11 different areas (town and landscape, town and building, process and method, urban- and building culture, space and habitation, space and form, building and realization, experiment and technology, technology and resources, conurbation and industrialization, and design and industrial form). With 1,300 Master's students, the school also undertakes research and currently employs 17 PhD students.
- *Aarhus School of Architecture*. Located in Aarhus. With 200 students, this school of architecture is smaller than the Royal Academy in Copenhagen. The School offers a specialized programme in industrial design.
- *The Glass and Ceramic School on Bornholm* is a very specialized, fully publicly funded three-year programme in glassworks and ceramics, which gives graduates the option of proceeding to a Master's programme at Denmark's Design School. The school has approx. 20 students.
- Furthermore, technical schools throughout the country offer one-year specialized design programmes, and there are a range of small private schools and folk high schools providing short programmes and courses in design.

The following institutions combine shorter programmes, where craft skills are often combined with more generic and sometimes also commercial skills.

- *Den Grafiske Højskole*, Copenhagen. The school has 150 students and offers BA programmes in graphic design plus in-training courses, aimed at graphic design firms and other firms using graphic designers.
- *Højer College*, South Jutland. As part of government policies of centralizing the educational programmes and courses on offer in order to achieve scale economies,

industrial design and textile design are no longer taught. The school now offers a BA programme in graphic communication, which is based on a more generic and communicative approach than other national graphic design courses, and is offered partly in English. The number of students is less than 50.

Universities are now also offering longer and shorter programmes and courses combining design skills with management-oriented skills:

- The civil engineering programme in architecture and design, *Aalborg University*, with notable management and marketing elements.
- The civil engineering programme in design and innovation, *The Technical University of Denmark*.
- The civil engineering programme in integrated design, *University of Southern Denmark*.
- The Master's programme in interactive design, *University of Southern Denmark*.
- Master's programmes are underway at both *Roskilde University* and the *Copenhagen Business School*. Management skills take centre stage in both these programmes.

Most of the new educational initiatives and changes in the institutions are in their infancy or not yet started, and few evaluations currently exist. Whereas the establishment of *new* programmes combining design and managerial skills are welcomed by most industrialists, the ongoing change of the education at Denmark's Design School and the pressure put on other specialized educational institutions to follow suit and provide more generic, research-based skills is very controversial, sparking heated debate among policymakers, teachers, and industrialists. Firms with different managerial styles and undertaking different activity areas disagree on what they perceive to be the most vital skills provided by, for example, Denmark's Design School or the schools of architecture. Some firms with very specialized competencies (typically craft-focused, and less oriented towards exporting, and firms that are relatively isolated horizontally within fashion, architecture, and furniture design) maintain that craft skills are so much more important than generic and managerial skills that simply taking the latter skills into the mentioned schools would undermine the future competitiveness of the Danish design industry. Other firms claim that their need for designers with both craft skills, generic design skills, and managerial skills (Italian or UK style) is now critical. Currently, the debate is so heated that few listen to people like the president of Denmark's Design School who claim that the current changes accommodate both sides of the debate.

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