ICSID

International Council of Societies of Industrial Design

SUMMARY REPORT OF ICSID SEMINARS ON THE EDUCATION FOR INDUSTRIAL DESIGN

SUMMARY REPORTS
ON ICSID SEMINARS ON
EDUCATION FOR INDUSTRIAL DESIGN

FOREWORD

ICSID, the International Council of Societies of Industrial Design, was founded in 1957. In 1970 it numbers 57 member societies from 32 countries.
ICSID is recognized by UNESCO as the responsible body for all matters of Industrial Design.
Ever since its inception, the International Council has been conscious that the problem of education is basic to the development of the profession.
In order to provide programmes of courses of Industrial Design which could be applied to schools all over the world, ICSID has organised to date three Seminars, attended by specialists of many countries.
These meetings were made possible thanks to the generosity of UNESCO, the Hochschule für Gestaltung at Ulm, the Syracuse University in the USA, the Kaufmann Foundation and American Industry, respectively.

INTRODUCTION

This report was prepared on the instructions of the ICSID Education Commission given at its meeting in London on 29 March 1969.

Its purpose is to provide a short, informative guide, based upon the seminars of the ICSID Education Commission, which will be of use to those concerned with industrial design education and with the establishment of new schools.

The information contained in the report has been extracted from the following documents:

- The Education of Industrial Designers. First Seminar.
  Report of a seminar organised under the auspices of UNESCO by the International Council of Societies of Industrial Design - Bruges, Belgium, 21-24 March 1964.
- The Education of Industrial Designers. Second Seminar.
  Report of a seminar organised by the Education Commission of ICSID in collaboration with the Hochschule für Gestaltung - Ulm, Germany, 17-19 September 1965.
- The Education of Industrial Designers. Third Seminar.
  Report of a seminar organised by the Education Commission of ICSID in collaboration with the University of Syracuse, New York, USA, 7-10 September 1967.

As far as possible the original texts have been left unchanged. Editing has been confined to arranging the material in a logical order and adding notes and cross references to assist in the classification and interpretation of the texts.

REFERENCES: B = Bruges Report
U = Ulm Report
S = Syracuse Report
p. 7 = Page 7
(3.1) = paragraph number

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CONTENTS

1. A definition of industrial design.

B.p.7.(3.1).

Industrial design is a creative activity whose aim is to determine the formal qualities of objects produced by industry. These formal qualities include the external features but are principally those structural and functional relationships which convert a system to a coherent unity both from the point of view of the producer and the user.

Industrial design extends to embrace all aspects of human environment which are conditioned by industrial production.

2. The design process. U.p.4 (1.0)

2.1. The design process consists of 4 stages:

- The accumulation of information.
- The analysis of the facts relevant to the design problem.
- The making of hypotheses based on an analysis of the facts.
- The verification of the hypotheses.

2.2. The third stage, the hypotheses, is influenced not only by the known facts but also by the social and individual character of the designer. It is simultaneously a rational and an intuitive process. It becomes a creative act of greater or less intensity dependent on the capacity of the designer to draw conclusions from the factual analysis and to perceive new relationships between what is known and what he believes can best serve the user of the product in the always changing environmental situation.

2.3. The process of verification is dependent on assumptions concerning the technical and social qualities of a product. The former can be objectively evaluated, the latter is largely dependent on subjective interpretation. At one extreme a product may be considered to have fulfilled its function if it can be sold in the quantity necessary economically to justify its production and marketing. At the other extreme the hypothesis which initiates the design is only considered valid if the product is of social value whether the market for which it is produced is willing or not to purchase it. It is argued that the product should be ahead of existing market demands and itself generate new social and cultural needs. Decisions on this vital problem of the basis for verification will affect the emphasis each school places on different parts of its curriculum: on this there is as yet no international agreement, as the attitude to consumer acceptance is greatly influenced by the cultural, economic and industrial condition in each individual country.

2.4. It is agreed, however, that the education of the designer must be basically rational and scientific, but that this

must be transmuted by an equal understanding and appreciation of the humanities.

2.5. While the design process can be divided for purposes of clarification into the four sectors listed above, that division has little reality in the actual design process in which the objective and subjective attitudes constantly react with each other. Sometimes the one and sometimes the other is dominant. The formal aspect of design cannot be separated from its technological and social necessities. Design is a single unified activity and the justification for industrial design education resides in its capacity to produce designers who are able to function in all sectors of the problem even if their technical speciality must of necessity remain within a restricted field. The main function of design is to humanize our technologically orientated civilization, to erect standards of quality and standards of preferential behaviour: consciousness of that end must be the fundamental basis for education in industrial design.

3. Working hypothesis as a basis for differentation between education for industrial design and for related subjects. U.p.1.

"Industrial design is concerned prima-
"rily with the relation of products and
"systems to those who use them, thus it
"requires an attitude to education which
"differs from that traditionally accep-
"ted as proper for the education of
"engineers and other related professions".

4. The aims and basic competence of the industrial designer. S.p.8.(4)

Industrial design is concerned with the humanising of technological development. Education of industrial design, while satisfying immediate needs, should be oriented toward the forecasting of new products and the innovation of systems which will contribute to the satisfying of human needs.

4.1. The role of industrial design in the control of growth. S.p.9.(11)

In the future, the traditional activity of design for growth will continue to be essential, but it will be necessary to develop at the same time a new kind of design activity. This will be to find and define new kinds of design instruments for controlling - or regulating - the growth process. There are certain countries where design for growth is the most important and urgent thing. But in other countries, for example the USA, design for control is the more urgent aspect

5. Integration and specialisation in industrial design education. S.p.8.(3)

Industrial design is an activity in which theoretical comprehension and technical ability must be completely integrated with the capacity to communicate. The method of achieving this integration is dependent upon the academic knowledge and technical skills which the student has acquired when he commences the course in industrial design. This will effect the emphasis given to different aspects of the course, but the end result must be the same - a graduate student able to comprehend problems in industrial design, resolve them and communicate their solutions.

5.1. The place of the profession in industrial design education. S.p.9.(10)

The design profession should be concerned with and accept a degree of responsibility for design education, but this concern should be consultative rather than authoritative and should at no time interfere with the academic freedom of the schools of design.

6. The industrial design student. B.p.7.(3.3)

6.1. In the present circumstances the education of the industrial design student should not start before the age of eighteen years. The student chosen should have a high standard in general education and show aptitude in both science and art. He should possess potential creativity and a sense of social responsibility.

7. The length of the industrial design course. B.p.7.(3.4) B.p.9.(3.13) S.p.8.(1) S.p.8.(2)

7.1. Normally, there should be a one year primary course, plus a four year industrial design course, totalling five years, although the different standards of general education which students in different countries attain before commencing a course in industrial design, plus variations in the content of the course, may require variations from the norm of five years.
In any event, the course in industrial design should not be shorter than that considered appropriate for comparable professions such as architecture and engineering.

7.2. The first year of the course should be considered as part of the total education for industrial design and should not be artificially separated from it as a "fundamental" or "basic" year. The primary year should be as logical and controlled as the remainder of the course.

7.3. A proportion of the students should proceed to post graduate study.

U.p.11.(15)

This should take the form of advanced studies or research in a specific field of industrial design or in an aspect of its theoretical or technical basis.
Post graduate work should normally continue for a period of from 1 to 2 years and be under academic direction.
Such advanced studies can often be usefully undertaken after a period in industry following the completion of the undergraduate course.

7.4. Periods of industrial experience.

B.p.7.(3.6)

During the course, each student should be required to spend some time inside industry or in a professional design office. The total time thus spent during a five year course should not be less than three months and not more than twelve months. In order not to interrupt academic studies the time spent in industry should be divided into periods each of not more than three months.
This industrial experience is an integral part of the course and while acquiring it the student should remain under the control of his school.

8. The number of students in a group.

U.p.6.(4)

The number of students in a group working on related projects under the guidance of a single professor or tutor should be from 8 to 10. Lectures and similar direct instruction can usefully be given to large groups.

9. Student-staff ratio.

U.p.7.(5)

The overall ratio of full-time academic staff to students should not be less than 1 to 10, or the equivalent comprised of a combination of full and part-time staff. This excludes workshop instructors and technicians who are required in addition.

It is not anticipated that the 1 to 10 ratio can be reduced by the use of programmed teaching devices as those would lessen the need for personal instruction only in that relatively minor part of the curriculum which is concerned with the direct accumulation of knowledge.

10. The environment for the school of industrial design.

B.p.7.(3.7)
B.p.8.(3.8)

10.1. In the present situation there is value in industrial design schools being incorporated in design polytechnics, subject to each department enjoying a proper degree of academic individuality and freedom. This is, however, a developing situation which could well grow into different academic groupings. For example a school of environmental design would relate industrial design to such subjects as engineering, architecture, town planning, and the social sciences.

10.2. Relation of the school of industrial design with other studies.

The school of industrial design, although academically independent:

1. should be closely linked with a school of engineering for essential technical instruction.
2. should be associated with a school or department of business management to give the student a sense of involvement with industrial and commercial organisation.
3. Contact with the humanities should be maintained either within the industrial design school or by close links with other schools or departments concerned with the arts and social sciences.

10.3. Workshop facilities.

U.p.7.(6.0)

Workshops are an essential provision in schools of industrial design. They should be sufficiently large and well-equiped to allow all students to make models and prototypes as the final stage of their major design projects.
The workshops are intended to be an aspect of design study and communication and the craftsmanship involved is of no importance as an end in itself.
The workshops should provide adequate facilities for work in metal, plastics, plaster and wood. Facilities for photographic work and typography are also required.

U.p.8.(7.3)

After students have been properly trained to use the workshop machinery efficiently and safely, they should be free to do so. Only in exceptional cases should machines or other equipment be restricted to use by the technical staff.

U.p.7.(6.4)

Work in the model and machine shops enables the students to test the validity of their designs in three dimensions and serves also as an introduction to the behaviour of materials in industrial production. It is, however, essential for workshop practice in the school to be supplemented by visits to factories so that the students become aware of the major differences between the technical requirements for model and prototype work and the potentialities and limitations of full scale industrial production.

11. The content of the course

U.p.5.(2)

11.1. The aim of the five year course is to educate student designers who, given the necessary industrial experience will be able to serve industry at a professional level. Technical skills and knowledge play an essential part in the curriculum but scientific and social studies are equally important in developing a sense of social responsibility and an understanding of the nature of industrial society. The implications of our industrial environment must be clearly comprehended as that provides the matrix for the creative activity of the industrial designer.

The three basic areas of study can be classified as:

Information
Formation (i.e. Design)
Communication.

11.2. Information will include the study of the Social, Physical and Natural Sciences and the Humanities.

Minimum list of subjects.

S.p.8.(5)

Finite mathematics
Physics
Elements of chemistry
Elements of applied psychology
Elements of mechanical, electrical and electronic engineering
Properties of materials
Elements of production processes
Ergonomics
Elements of systems engineering
Social and cultural history
Elements of economics
Marketing

Professional practice

11.3. Formation

U.p.5.(2)

is concerned with the creative process of design and will include abstract exercises and those which are directly applied to the solution of given industrial problems. Some exercises will be concerned with the design of products, others with the resolution of systems.

S.p.8.(6)

Design theory and methodology.
Abstract design projects
The design of products
The design of systems
Graphic design

11.4. Communication

U.p.5.(2)

is concerned with the transmission of design decisions to those who must manufacture the product or initiate the system. It includes mechanical drawing, sketching and graphic representation, model making and prototype fabrication, photography and film, the spoken and written language and computer techniques.

11.5. U.p.5.(2.2)

The classification is intended only to be indicative of how the curriculum in a school of industrial design should be formulated and is clearly capable of being differently stated.

U.p.6.(2.3)

The three broad divisions of the course should not be separately studied in sequence. The guiding principle in constructing curricula should be the need for the integration of the different disciplines so that they are always related to the solving of design problems of progressive complexity. The normal academic methods of lectures being separated from design development is not appropriate to education for industrial design.

S.p.9.(8)

As a guide, of the total time available for the course, between one third and one half would be devoted to 'Information', with between two thirds and one half for 'Formation' and 'Communication'.

11.6. General studies. B.p.7.(3.11)

General studies are those subjects which are related to but not part of the methodology or technology of design. General studies should be included in the course, the time allocated for these being ten to fifteen percent of the total five year course.

The general studies may include such subjects as:

history of art and science
music
literature
architecture
philosophy
psychology

12. Organisation of projects U.p.8.(8)

12.1. The first year of the course.

The first year of the course should not be separated from the rest of the course as a "fundamental" or "basic" year. It should be an introduction to all subjects which will be studied in greater depth during subsequent years.

The liberation of creativity is an essential aspect of the first year of the course and that should be achieved by the exploration of form, surface, colour, structure and mechanics within the confines of specific design programmes. The design programmes in the first year should progress from abstract generalizations to specific industrial problems.

12.2. The setting of design projects.

U.p.8.(9)

12.2.1. In the first and second years of the course all students in the group should work on the same design projects as their education is quickened by comparing their solution to the design problem with those of their colleagues. From the third to the fifth year the students should be progressively more free to select their own design projects. The final decision on projects must, however, remain the responsibility of the tutor as the real academic needs of the students may differ from their personal predilections.

12.2.2. Useful results can be obtained by setting different projects to individual students when these are aspects of a comprehensive larger problem. For example, individual students could work on the different elements in a domestic kitchen, on a related group of scientific measuring devices, on ground equipment for aircraft and so on.

12.2.3. Team work is not useful in the first two years of the course, but is feasible during the last three years. The student team should not be larger than 4. Such teams could study and find design solutions to comparatively complex problems such as the interior of a passenger aircraft or a "heart unit" for prefabricated housing.

U.p.9.(10,11)

The teams can usefully be enlarged by adding to them student mechanical engineers, psychologists and others with specialized knowledge appropriate to the project which is being studied.

12.3. The formulation of project programmes

12.3.1. The formulation of the brief or programme is the essential initial stage which must be completed before any design project can be undertaken. Student participation in the formulation of the programme is useful in increasing their awareness of the design process.
It is sometimes useful to ensure full participation of the students in programme preparation by holding a seminar to discuss all aspects of the project before work on it commences.

12.3.2. The extent of student participation in this first stage must, however, be dependent on the academic programme as a whole and there may well be circumstances when it is preferable for the programme to be fully formulated by the academic staff.

12.3.3. Similar discretion should be used in deciding the degree to which students should participate in the collection of information and data which follows the formulation of the brief. In the early years of the course it is useful for the students to gain experience in the techniques of information collection and analysis, in the 4th and 5th year it may be preferable for all relevant data to be supplied to the students so that they have more time for the solution stages of the design project.

12.3.4. In all stages of the education of the student it is important to stress that the formulation of the programme and the collection and analysis of data are only the first stages in the design project and should never be so magnified in importance as to become ends in themselves.

12.4. The allocation of time to design projects.

12.4.1. The solution of design problems is an essential aspect of the development of the students and the period allocated to each design project should be limited to allow the students relatively wide, if superficial, experience in problem solving. The academic value resides more in the attempts to find solutions than in the completion of any single project to professional standards.

12.4.2. During the first and second year of the course not more than 3 months should be allocated to a single project. The period may be progressively increased to allow for greater depth of study but should never exceed 10 months for any one design project.

12.5. The proportioning of time within a design project. U.p.10.(12,13)

12.5.1. When the design project is set the student should be given a definite time programme for the three main stages of the work i.e. the information stage, the formation stage, the communication stage.

12.5.2. The time allocated to each stage will depend on the academic intention of the project, but it is necessary for the student to gain adequate experience in the problems arising from each stage and one aspect of the design process should not be over emphasized in relation to the others. The capacity to communicate by working drawings and presentation drawings is as essential to the industrial design student as is the ability to collect, collate and analyze data.

12.6. The evalutation of student projects.

12.6.1. The basis of education for industrial design is the undertaking of design projects which proceed from abstractions to progressively more complex problems and systems. The criticism of such work can best take the form of daily discussion between student and tutor. This tutorial dialogue is assisted by group discussion in which students criticize each other's work.

12.6.2. This continual process of individual and group comment on a design project should be terminated by a final criticism which can be a private discussion between student and tutor or be undertaken by the whole student and staff group. The latter has some advantage in requiring the students formally to express their solutions to a group of people and thus begin to prepare them for this necessity in their later professional life.

12.6.3. It is useful sometimes to invite technical experts and others from outside the school to attend interim or final project evaluation meetings. Comment from such people who are biased towards one specific aspect of the design project can add reality to the arguments of both students and staff.

13. Examinations. U.p.10.(14)

13.1. At the conclusion of the course the progress of the student should be evaluated and appropriate diplomas awarded. The forms of evaluation or examination will vary according to the academic traditions and conventions of each country, but they should take properly into account the progress of the students in each of the major aspects of the course.

13.2. The final evaluation should include a review of the work of the student over the whole period of his study, and of theoretical and practical work specifically undertaken as part of the diploma examination.

13.3. All schools should have systems of intermediate evaluation or examination to judge the suitability of students progressing to the next stage of the course.

14. Teaching staff. B.p.9.(3.14)

14.1. Qualifications of design teachers.

Only those with substantial practical experience of industrial design, either in terms of actual practice or design research development, are properly fitted to educate industrial designers.

This restriction does not apply to the teachers in the many other disciplines and technical specialities which are contributary to industrial design education.

14.2. Teaching staff in professional practice. B.p.9.(3.15)

Teaching staff should be encouraged to continue their professional practice.

U.p.6.(2.4,2.5)

14.3. The need for the direct relation of theory to practice postulates education based on teams of specialist tutors combining to provide the instruction needed in the different disciplines encompassed in a single design problem. It is unlikely that such instruction can be provided by the attendance of students for specialized subject study in institutions, outside the school of industrial design, where traditional methods of instruction are used. For example it may well be that the theory of structures may be taught at a school of industrial design by first designing and making models of the structures and only afterwards analyzing them mathematically.

14.4. The proposed method of education by teams of tutors does not exclude the use of visual-audio aids or other techniques for instruction, but these also need to be specifically programmed to the needs of a course in industrial design and not used as disassociated mechanisms for learning by memorizing.

15. Workshop technicians. U.p.7.(7)

The workshop should be staffed by experienced technicians whose primary task is the training of the students in the most effective use of the machines and in the techniques of model and prototype fabrication. The technicians should also be available to assist the students in the construction of finished models and prototypes to avoid an undue proportion of the students' time being devoted to purely mechanical work. It is appreciated that the extent of such assistance must be limited by economic considerations.

U.p.8.(7.2)

15.1. The ratio of technical staff to students should be not less than 1 to 10.

U.p.8.(7.4)

15.2. The technical staff should be directly responsible to the academic head of the school or department and should be concerned only with technical instruction.

16. Acceptance by the school of commissions from industry. B.p.9.(3.16)

Industrial firms or organisations may be invited to set projects within the school subject to the control of the project being the responsibility of the academic staff and in complete accord with the academic programme.
If such an exercise produces results of commercial value, then the fee for such work should be paid to the school and not to the professor or the students. The fee charged by the school shall not be less than that charged by professional designers.

17. Establishment of design education in the developing countries.
B.p.10.(3.18,3.19)

17.1. It is appreciated that these schools will have their own characteristics arising from their historical and cultural situation which may require them to differ fundamentally from those in the already highly industrialised countries.

17.2. Establishment of regional institutes of industrial design.

In the developing countries the early steps towards improving standards of industrial design may be the establishment of regional institutes of industrial design. These should be manned by nationals of the countries involved who would invite expert advisers from time to time for comparatively short periods.

18. The number of schools. U.p.6.(3)

The number of schools of industrial design in each country, and the size of each school should be related to the present and potential industrial output of the country. The number of students who graduate each year should be related to the number that industry is able to employ, taking into account the anticipated growth in demand for graduate students. The possibility of students working abroad in countries which are not adequately served by their national schools of industrial design will affect the quantitative evaluation.

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