Problems in the Reform of Design Teaching and Solutions
Taking Shandong University of Art & Design as An Example

Lei Sun
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This article takes the teaching reform of the undergraduate program in Shandong University of Art & Design as a case for study. Through surveys with students, teachers, and employers, it finds out three core challenges faced by the design majors, and proposes three correspondent solutions, namely to use “aptitude-based teaching to cultivate talents”, “learning-assisted teaching to classify the teaching system”, and “learning-promoted teaching to innovate lectures”, which lead to a philosophy for the reform, where student’s development is regarded as the very foundation of all learning, and their achievement as the orientation of all work. This article analyses the common phenomena and problems faced by design education, raises possible solutions and a guiding philosophy, which have both theoretical and practical significance.

Keywords: art and design; teaching reform; student development; learning achievement

1 Introduction
Art and design has won wide recognition as an innovative driving force of mid-to-high-level development. The way to cultivate highly skilled and interdisciplinary talents that meet the needs of the times during economic, social and cultural transitions, and to enhance the strength of design students, has become the focus of the reform for art and design programmes in colleges. In 2012, right after “design study” had been upgraded to a second-tier discipline, colleges of all types across the country began to add it as a regular programme, which led to highly homogeneous and monotonous modules. Against this background, the important question for the application-oriented colleges specialised in art is then how to cultivate versatile design talents with characteristic modules.

2 The Internal Drive and The Philosophy of The Reform for Art and Design Education
To build a high-level application-oriented art university, Shandong University of Art & Design has positioned itself to be more “practical teaching” and “application”-focused, which is different from the “research-based” universities. It attaches more emphasis on module building, and on the cultivation of students with a wide range of generic knowledge, good understanding of science, arts, art innovation, and skills, good capacity in employment, in starting their own businesses, and in career development.
And to meet our positioning and goals, we must first figure out the logical deduction of our training targets, graduation requirements, curriculum system, and resource allocation for students in art and design. We also need to answer such questions as how to improve the innovation and practical ability and the teaching of it? What is the specific way to achieve it? Is there a mature theory for reference? At the same time, we must also see that the current higher design education in China is basically completed in comprehensive universities, multi-disciplinary or single-disciplinary specialised universities, and vocational and technical colleges. There are still some homogeneity and universal problems in the study, mainly as follows:
Problem 1: The art and design education lacks clear logic that links “students, graduation requirements, curriculum system, and resource allocation”. Training goals are inconsistent; some of the modules are broken; tasks and results are not in line with each other, while teaching, learning and management are acting at
variance with their own principles, resulting in failure in all the respects.

Problem 2: Art and design education is habitually “discipline-orientation”, that is, teachers focus more on the knowledge required by the discipline itself, regardless of, to some extent, what professional practice and the students need. Three major problems have emerged during training students: narrowing training path (knowledge supply), path dependence (knowledge dissemination), and path congestion (knowledge demand and consumption). The mismatch between the knowledge supply side and the demand side leads to a separation between teaching and learning, and also between learning and application.

Problem 3: The curriculum lacks both systematic construction horizontally and logical relationship vertically. It is not linking closely with the needs of students or professional practice, and in particular, fails to fulfill training goals, or meet graduation requirements. Its effectiveness needs to be improved and the inconsistent teaching methods need to be addressed.

Problem 4: Teacher shortage, unsound payment, reward and punishment mechanisms, as well as unnecessary comparison and laziness in teaching, exist. Lectures are mere knowledge cramming to handle the school administrative department. What teachers say are the truth to students, who, consequently, lacks hands-on practice or critical thinking.

Problem 5: Traditional lectures are closed. They are presented to a fixed group of people, in a fixed place, within a fixed time, and with fixed contents. Both teachers and lectures are unvaried and neither the “hard training” nor the “soft training” is scientific. All these result in a lack of motivation for “teaching” and “learning”. Students, in particular, are doing poorly in self-learning, and are limited to select modules that are already scarce. On the whole, teaching is “involting” in varying degrees, and the classroom lacks vitality.

Problem 6: Traditional art and design education emphasises teaching, while pays less attention to learning. The trend is still common in today’s lectures. The incentive mechanism for teachers is unsound. Teachers lack the capacity to provide “high-quality optional modules” or “high-standard modules”. What also lack are standards that allow “teaching” and “learning” to be traceable and measurable, so as to address the supervision and evaluation problems.

In response to the above problems, we believe that the current art and design programmes need a reform for the system and mechanism in order to better help students grow. It should not only emphasise teaching, but also learning, so that the two may reinforce each other, improving both teachers and students. The reform should put “modules” on the centre, focus on the two key elements (namely “student” and “teacher”), build a comprehensive management system that takes module selection as the core, which is supplemented by teachers’ guidance, and measure the quality and quantity of learning through grade points and credits. With these steps, student’s development should be regarded as the very foundation of all learning, their achievement as the orientation of all work. And with this reformed system, innovation can be made to the whole university management system.

3 The Three Questions to be Answered in the Reform of The Art and Design Education

By integrating the philosophy in our university for training students, its programme settings, as well as a large number of investigations on students, teachers and employers, we have summarised the three major questions that need to be answered in the reform of art and design education and its supporting measures.

3.1 How to encourage freshmen to find their preferred knowledge areas for study, thus freeing them from the crammed and homogeneous knowledge learned in high school for Gaokao (college entrance examination)?

Narrowing path in training students: students generally have such problems as ambiguous learning goals, insufficient motivation, and poor awareness of changing their way of learning. Path dependence in training students: traditional training model attaches greater importance to teaching than learning. Lectures are more about imparting knowledge and experience. Curriculum, including its structure and content, is monotonous. Path congestion in training students: traditional lectures are presented to a fixed group of people, in a fixed place, within a fixed time, and with fixed contents. Students are not free to select preferred modules or lecturers. Therefore, the way to add more high-quality modules, address the teacher shortage, and encourage students, especially the fresh ones, to be more aware of what they want and need to learn, so they may turn passive learning into active learning, should be highlighted in college education.

3.2 How to provide diversified education and make training more effective?

The core ability that an art and design student should master is two folded: one is to grasp the new theories, skills, and approaches emerged from the art and design discipline; the other is to be able to discover, analyse,
and solve problems, even make innovation. Due to insufficient teaching resources, inconsistent module settings, and poor teaching philosophies, what the students learn from college, and their ability to put that into practice, cannot meet the needs of enterprises. Therefore, in order to improve undergraduate education, the key is to link up social needs, graduation requirements, curriculum structures and contents, and teaching resources, and to cultivate student core competence.

3.3 How to improve student’s social competence?
In the current job market, on the one hand, graduates trained by design colleges face the “hardest employment season” to them; on the other hand, enterprises have an increasing demand for innovative and applied talents, but are unable to find enough of them. The primary reasons are: school training is out of touch with the needs of enterprises; students are not creative enough, and they are unenthusiastic in making innovation happen. But we should also not forget the lack of emphasis in college on putting theory into practice and cultivating business skills. Therefore, how to address the homogenisation in teaching, the low achieving in innovation and entrepreneurship, and to ensure the consistency of graduation requirements, training goals, and the curriculum system, so as to make what has been taught in college useful in business, is the key.

4 Main Reform Measures and Paths

4.1 Aptitude-based teaching: Build an “ice cube framework for talent training” to maximise training goals and the effectiveness of resource allocation
Focusing on the training goal of cultivating innovative and applied talents of art and design, we built an “ice cube framework for talent training” in which module contents, teaching, experiments, module design, and practice are closely related in accordance with students’ cognitive rules and learning outputs.

The “ice cube framework for talent training” is based on the natural phenomenon where ice melts into water
and refreezes. We based the training process for art and design students on this phenomenon, and re-allocated resources and re-designed modules. The art and design education of higher learning needs to be addressed from three aspects: first, since the homogeneity caused by the college entrance examination mechanism is like an ice cube, then how will we “unfreeze” it with generic education and liberal studies? Second, how can we provide diversified education and “liquidised” teaching to meet students’ thinking preferences and urgent needs for self-directed learning? Third, since students have differed needs for employment, how can we improve their competence? To this end, we proposed to connect the achievement/goal-oriented approach with the entire training process. Based on the four-year or the five-year academic system, we divided the training process into three “key competence” building stages, namely the knowledge-based training, the student-based training, and the society-based training. We matched the goals for training at different stages with the “melting-water-refreezing” model, and develop modules and lectures accordingly.

Training stage 1: The goal of the “knowledge-based – unfreezing stage” is to encourage students, through the novel environment, content, and teaching method, to change their inherent way of thinking and their cognitive process. In this stage, we should pay attention to student’s mastery of the four types of knowledge: know-what, know-why, know-how, and know-who. “What is it” “how is it” and “why is it” emphasise the acquisition of descriptive knowledge based on “cognition and construction”; “what to do” and “how to do it” emphasise the acquisition of procedural and technical knowledge characterised by “judgment and exploration”. The goals emphasise strategy, task, individual growth, and the acquisition of meta-cognitive knowledge of “imagination and emotion”. Teaching in the “unfreezing phase” is to change the cognitive process formed by rote memorisation and help students to get used to “self-direct learning” (which includes four parts: independent exploration, selection, construction, and creation). At this stage, we should create a classroom that motivates students. To realise it, the setting should emphasise “learning by playing” (that is to
emphasise the synergy between hands-on practice and thinking) and “learning by doing” (that is to emphasise atmosphere and inspiration).

By evaluating the course satisfaction, the clearness of teaching targets, the rationality of assess methods and the degree of course difficulty in 2018, it could be concluded that the pertinence of course satisfaction and the clearness of teaching targets, the rationality of assess methods were relatively high as the Pearson’s correlation coefficient were 0.8 and 0.7, while the pertinence between course satisfaction and course difficulty was weak, for its Pearson’s correlation coefficient was just -0.14. For students, they take the clearness of teaching targets and the assess methods priority. So, as the most significant part for the university is to clarify the teaching targets, teachers should provide syllabus and explain the relationship between graduation and teaching targets before class, while the assess methods should also be based on the targets.

In 2019, according to the survey taken by a third party evaluating organization, students who studied Art and Design in 2018 had great improvement in knowledge reserve (evaluated by the sum of great improvement and have proportional improvement), and thus had clear ‘unfrozen’ result.

Table 1. Knowledge targets achievement of art design courses in Shandong University of Art and Design (unit: %)

| Major                              | Knowledge category     | I’ve learned a lot | I’ve learned some | I’ve learned little | I’ve learned nothing |
|------------------------------------|------------------------|--------------------|-------------------|--------------------|---------------------|
| Product Design (industrial design) | Professional knowledge | 42                 | 54                | 4                  | 0                   |
| Product Design (industrial design) | Basic discipline knowledge | 36               | 60                | 3                  | 1                   |
| Product Design (industrial design) | Instrumental knowledge | 35                 | 57                | 6                  | 2                   |
| Product Design (industrial design) | Humanities knowledge   | 34                 | 57                | 7                  | 2                   |
| Apparel and Apparel Design         | Professional knowledge | 60                 | 40                | 0                  | 0                   |
| Apparel and Apparel Design         | Instrumental knowledge | 51                 | 47                | 2                  | 0                   |
| Apparel and Apparel Design         | Humanities knowledge   | 47                 | 51                | 2                  | 0                   |
| Apparel and Apparel Design         | Basic discipline knowledge | 45              | 53                | 2                  | 0                   |
| Art and Design                     | Professional knowledge | 52                 | 45                | 3                  | 0                   |
| Art and Design                     | Instrumental knowledge | 51                 | 46                | 2                  | 1                   |
| Art and Design                     | Basic discipline knowledge | 50              | 49                | 1                  | 0                   |
| Art and Design                     | Humanities knowledge   | 46                 | 49                | 5                  | 0                   |
| Public Art (handicraft)            | Professional knowledge | 53                 | 41                | 6                  | 0                   |
| Public Art (handicraft)            | Basic discipline knowledge | 53              | 35                | 12                 | 0                   |
| Public Art (handicraft)            | Instrumental knowledge | 47                 | 47                | 6                  | 0                   |
| Public Art (handicraft)            | Humanities knowledge   | 41                 | 41                | 18                 | 0                   |
| Public Art (plastic art)           | Professional knowledge | 31                 | 69                | 0                  | 0                   |
| Public Art (plastic art)           | Basic discipline knowledge | 19              | 81                | 0                  | 0                   |
| Public Art (plastic art)           | Instrumental knowledge | 13                 | 75                | 12                 | 0                   |
| Public Art (plastic art)           | Humanities knowledge   | 6                  | 88                | 6                  | 0                   |
| Environmental Design               | Professional knowledge | 59                 | 37                | 4                  | 0                   |
| Environmental Design               | Instrumental knowledge | 54                 | 42                | 4                  | 0                   |
| Environmental Design               | Basic discipline knowledge | 52              | 46                | 2                  | 0                   |
| Environmental Design               | Humanities knowledge   | 51                 | 46                | 3                  | 0                   |
| Visual Communication Design        | Professional knowledge | 48                 | 50                | 2                  | 0                   |
| Visual Communication Design        | Instrumental knowledge | 44                 | 52                | 4                  | 0                   |
| Visual Communication Design        | Humanities knowledge   | 38                 | 55                | 7                  | 0                   |
| Digital Media Art                  | Professional knowledge | 48                 | 46                | 6                  | 0                   |
| Digital Media Art                  | Instrumental knowledge | 46                 | 48                | 6                  | 0                   |
Training stage 2: the goal of the “student-based – water stage” is to form melted water into a new shape. In this stage, we should encourage students to learn, and study based on their own preferences and interests. Emphasis should be given on the cultivation of aesthetics, creativity, logic, and practice. At the “changing stage”, we should increase the number of optional modules, teachers, training space, and make classrooms more flexible. With these measures, students will be able to choose their preferred teachers, classrooms, and modules. We should also explore the task-based and the supervisor-based teaching systems, encourage students to learn what they are interested in beside the generic modules, promote the “knowledge-chain” module selection model, and call for “learning by doing” and “learning by experiencing” (which emphasise learner autonomy and experience).

In this stage, we examine the initiative of students through ten ways, which are ‘the attitude towards homework’, ‘the distribution of study time’, ‘the level of concentration in class’, ‘whether students learn from others’, ‘whether students conclude what have learned’ and ‘whether students make short-term plans’. Take 2018 as an example, students’ initiative was 77 percent, 8 percent higher than other universities which teach similar courses. Among them, the proportion of ‘the level of concentration in class’ sector happened in a high frequency (90 percent).

There are close relations between teachers’ ability and the likelihood of achieving the cultivation targets during the “students’ own post-water” stage. In the teaching ability evaluation process, ‘renew and improve one’s academic knowledge and skills’, ‘stimulate and maintain students’ motivation and concentration’ are the weakness parts in our school. Through further analysis, teachers in Visual Communication Design department, Industrial Design department and Formative Art department are more qualified (81%, 81%, 80%) than those in Practical Design department, Fashion department, Humanity and Art department (63%, 64%, 70%) in the case of ‘renew and improve one’s academic knowledge and skills’. While teachers in Formative Art department are
the most qualified (84%), compare with those in Fashion department (64%), Digital Arts and Media department (65%) and Visual Communication Design department (69%) in the case of ‘stimulate and maintain students’ motivation and concentration’.

Training stage 3: The goal of the “society-based – refreezing stage” is to prepare students for society and future projects. With proper methods, we maintain student’s ability of innovation and practice, and integrate such ability into their future career. The “re-freezing stage” focuses on the consistency of graduation design and training goals. It takes problem solving as the foundation, and breaks through barriers between programme, supervisor, student, college administration, and enterprises. It encourages students to choose their preferred supervisors and projects in accordance with their career plans. Therefore, a more practical, open, diversified, cross-border, and cooperative platform centring on problem solving built in this stage will help. Teaching in this stage emphasises “learning through competition” (that is to emphasises learning process and target), “learning through cooperation” (that is to emphasises the synergy within a team), and “cross-
domain learning” (that is to emphasises the link between learning and the application of it on different areas). In 2019, the third-party organization had analyzed the increasing rate of social ability of the students who studied Art and Design and relevant courses in 2018, the result showed that these students had general improvement in social ability (the proportion of big improvement plus the proportion of some improvement). Some specific skills in some courses still needs improvement, like the ability of cloth making in Clothing and Accessories major, the ability of creating in Public Art (handcraft) major and the ability of planning in Public Art (modelling) major.

Table 2. Achievement of social competence goals of art design majors in Shandong University of Art & Design

| Major                        | Skill                              | I’ve acquired a lot | I’ve acquired some | I’ve acquired little | I’ve acquired nothing |
|------------------------------|------------------------------------|--------------------|--------------------|----------------------|-----------------------|
| Product Design               | Design expression                  | 43                 | 53                 | 4                    | 0                     |
| Product Design               | Product aesthetics                 | 43                 | 53                 | 3                    | 1                     |
| Product Design               | Creative design                    | 44                 | 52                 | 3                    | 1                     |
| Product Design               | Function and structure design      | 41                 | 53                 | 5                    | 1                     |
| Product Design               | Modelling and making               | 41                 | 51                 | 7                    | 1                     |
| Product Design               | Comprehensive practice and management | 39               | 54                 | 6                    | 1                     |
| Apparel and Apparel Design   | Apparel engineering techniques     | 45                 | 38                 | 17                   | 0                     |
| Apparel and Apparel Design   | Apparel aesthetics                 | 64                 | 36                 | 0                    | 0                     |
| Apparel and Apparel Design   | Creative design                    | 51                 | 43                 | 6                    | 0                     |
| Apparel and Apparel Design   | Apparel marketing and management   | 38                 | 49                 | 11                   | 2                     |
| Apparel and Apparel Design   | Ethics and inheriting traditional culture | 47             | 49                 | 2                    | 2                     |
| Apparel and Apparel Design   | Comprehensive practical skills     | 49                 | 47                 | 2                    | 2                     |
| Art and Design               | Creative design                    | 54                 | 42                 | 4                    | 0                     |
| Art and Design               | Comprehensive practical skills     | 50                 | 43                 | 7                    | 0                     |
| Art and Design               | Artistic creativity                | 54                 | 42                 | 4                    | 0                     |
| Art and Design               | Aesthetic intelligence             | 57                 | 42                 | 1                    | 0                     |
| Art and Design               | Modelling                          | 51                 | 42                 | 6                    | 1                     |
| Art and Design               | Transforming and innovating traditional handicrafts | 54            | 41                 | 5                    | 0                     |
| Public Art (handcraft)       | Creative design                    | 65                 | 29                 | 6                    | 0                     |
| Public Art (handcraft)       | Comprehensive practical skills     | 59                 | 29                 | 12                   | 0                     |
| Public Art (handcraft)       | Aesthetic intelligence             | 59                 | 41                 | 0                    | 0                     |
| Public Art (handcraft)       | Modelling                          | 53                 | 29                 | 12                   | 6                     |
| Public Art (handcraft)       | Spatial sense and expression       | 59                 | 35                 | 0                    | 6                     |
| Public Art (handcraft)       | Material techniques and expression | 53                 | 41                 | 6                    | 0                     |
| Public Art (handcraft)       | Theme expression                   | 59                 | 35                 | 6                    | 0                     |
| Public Art (modelling)       | Comprehensive practical skills     | 38                 | 62                 | 0                    | 0                     |
| Public Art (modelling)       | Professional modelling             | 19                 | 75                 | 6                    | 0                     |
| Public Art (modelling)       | Artistic thinking                  | 25                 | 75                 | 0                    | 0                     |
| Public Art (modelling)       | Artistic creativity                | 13                 | 87                 | 0                    | 0                     |
| Public Art (modelling)       | Material application               | 25                 | 62                 | 13                   | 0                     |
| Public Art (modelling)       | Professional expression            | 19                 | 75                 | 6                    | 0                     |
| Public Art (modelling)       | Public art planning                | 25                 | 56                 | 19                   | 0                     |
| Environmental Design         | Expansion                          | 52                 | 44                 | 4                    | 0                     |
| Environmental Design         | Creative design                    | 56                 | 39                 | 5                    | 0                     |
4.2 Learning-assisted teaching: Aptitude-based training to meet student’s diversified requirements

To address the training mode that is provided to a fixed group of students, in a fixed place, within a fixed time, and with fixed contents, we proposed a “aptitude-based management system for training and teaching”. The system places “programmes” “target students” “modules” “credits” “teachers” “teaching space”, and many other elements on different levels. It highlights learning and achievement, and incorporates aptitude-based training, development, management, and evaluation into a framework for credit reform. With these measures, it replaces homogeneity with diversity, thus broadening the paths for student’s growth.

4.2.1 Classification of programmes

Based on the achievement of training goals, we put forward six major classification principles and 42 points. We conducted a comprehensive diagnosis of all our undergraduate programmes and divided them into A, B, C three categories. We then defined their respective development goals, tasks, and evaluation indicators. The goals for programmes that fall in Category A are to strengthen the relationship between basic and frontier knowledge and skills, intersectionality and synergy, characteristics and core competitiveness, and goals and problem solving; Category B is subdivided with the “gradient theory” into “medium-high gradient programmes”, “intermediate gradient programmes” and “medium-low gradient programmes” (all with specific tasks); programmes of Category C are subject to cancellation, merger, reduced enrolment, or enrolment in every other year.

In order to examine students’ profession identification after the classification, we take students in 2018 as an example, by investigating professional identification in seven areas(‘whether the students think academic learning process is full of interest’, ‘whether the students actively learn knowledge’, ‘whether the students will still choose their major if they are given other choices’, ‘whether the students choose job relevant to their major’, ‘whether the students are confident about the future of their courses’, ‘whether the students focus on recent news of their courses’, ‘whether the students think they are suitable for their courses’) and separating conclusion into three degree(really coincident, coincident and not coincident), it can be found that the Visual Communication Design had high identification(score 3.2), while Art and Design had relatively low
identification (score 2.7). As the identification affect students’ job target, employment competitiveness, passion towards study and the level of laziness, the university should focus more on students and courses that had lower identification, enhance vocational guidance learning and major adaptation education, cultivate students’ interest and thus increase the profession identification.

| Course                          | Score |
|--------------------------------|-------|
| Visual Communication Design    | 3.2   |
| Art and Design                 | 3.1   |
| Environmental Design           | 3.1   |
| Apparel and Apparel Design     | 3.1   |
| Average (SUAD art and design majors) | 3.03  |
| Art and Technology             | 3.0   |
| Digital Media Art              | 3.0   |
| Public Art (handicraft)        | 3.0   |
| Product Design (industrial design) | 2.8   |
| Public Art (plastic art)       | 2.8   |
| Art Design Study               | 2.7   |

Figure 5. The degree of professional identification of students majoring in art design in Shandong University of Art & Design (2020)

4.2.2 Classification of students

While keeping student’s personalities, interests, and preferences in mind, we positioned them according to their aptitude, abilities, and skills. Our university is the first of its kind in China to put forward the “classified cultivation plan for art and design students”, which help cultivate the “I-shaped design generalists” who specialise in an individual domain, the “T-shaped design professionals” who specialise in two domains, and the “/-/shaped cross-industry talents”, who specialise in three domains.

“T-shaped design generalists”: people with T-shaped talents are well-versed in a particular field of expertise (represented by the vertical bar of the “T”), while having the ability to work with specialists across disciplines other than their own (represented by the horizontal bar of the “T”). Such compound talents are the key training goals for most programmes of the university.

“I-shaped design professionals” refer to people that have grown in-depth knowledge and skills in a single discipline. Such talents are trained by programmes that emphasise applied technology, or painting, performance, and calligraphy programmes.

“/-/shaped cross-industry talents”: the slash here refers to the solid knowledge and cross-border skills a designer possesses. Such talents do not specialise in any field, but are able to work in a comprehensive and interdisciplinary setting.

4.2.3 Classification of module (group)

Based on knowledge, ability, quality, and teaching laws, we have built eight curriculum groups: generic studies, specialised basic studies, specialised studies, interdisciplinary studies, moral and traditional culture studies, innovation and entrepreneurship studies, comprehensive practice, and academic activities, which are composed of a progressive curriculum system featuring “Module (medium)-Module block (training unit)-Module group (training cluster)".
Generic studies are adopting a “generic studies 1+1” model, which consists of required modules and optional modules. There are 15 required modules (in 5 categories): “ideology”, “language”, “computer”, “health” and “discipline theory”, while there are multiple optionals (in six categories), including “science and life”, “history and culture”, “citizens and society”, “art and aesthetics”, “economics and management” and “art and life”.

Specialised basic studies: basic studies are the foundation of art education and student development. Most of the modules in this group are required ones. The modules must be based on the discipline, including its theories, principles, basic skills (for thinking, hand-painting, software, and so forth), basic modeling, traditional creation and modeling studies, research and design methods, among many others.

Specialised studies: the modules, mainly specialised optionals, are the core component of undergraduate education. They encourage diversified and innovative experiments in art and design, even under a constrained and restrictive setting. Two major module clusters are contained, namely the “creative experimental modules” and the “constrained modules”.

Moral and traditional culture studies are provided across the four years, with fixed credits and hours. All modules are set as required ones. We prevented the separation of ideological education from the specialised modules by developing modules that integrate fine traditional Chinese culture (languages, themes, elements, materials, crafts, and so forth) into the specialised basic studies and the specialised studies – in a form of creative design.

Innovation and entrepreneurship studies are composed of three training units, namely the strengthening foundation modules, advanced modules, and practical modules. The three module parts connect and support each other.

Comprehensive practice is an indispensable part for undergraduate education. It includes “group practice modules” (military theory and training, practical work, safety education and labour, vacation classes, and many others) and “graduation modules” (graduation investigation, practicum, project, and dissertation). It is an important part in training applied talents.

Interdisciplinary studies: first, we should strengthen the horizontal integration of different disciplines, especially paying attention to the knowledge in emerging, marginal, and cross-disciplinary areas; second, we should combine knowledge of arts and sciences, and arts and crafts, so that different knowledge systems will reinforce each other in study.

Academic activities: we support students to participate in exhibitions, competitions, and lectures. We also encourage achievements, patents, papers, awards, and so forth as they can play a role in expanding academic horizons and cultivating innovation and research capabilities.

At the same time, we clarified the content, the name, and the function of each module, so as to make them standard as required. Each of the above module group has fixed credits and hours, and is included in the university’s talent training plan. In terms of curriculum setting and syllabus, we encourage the priority order of “needs, technology (techniques, skills, engineering), design (creation, creativity, innovation, entrepreneurship), and culture” to improve methods and performance of talent training.
To sum up, in teaching, we combine university and teacher type with student’s preferences and points of interest; in training, we combine students, programmes, and modules with students’ preferences and points of interest; and in learning, we combine objectives and tasks with students’ preferences and points of interest. The measures enhance the pertinence, effectiveness and productivity of talent training, and the efficient use of resources.

In general, after imposing course classification, the ‘fundamentality’, ‘applicability’, ‘depth’ of teaching are all higher than other universities which focus on similar areas. The proportion of students from Art and Design department who think the course ‘focus on cultivating students’ operational ability’ (96%) is higher than those who think the course ‘focus on the foundation of relevant knowledge’ (83%).
4.3 Learning-promoted teaching: A four-level training system for innovative teaching and solid practice

The ever-changing social needs put forward new requirements for the training and supply of talents, especially their ability to innovate and to put theory into practice. Therefore, we combined OBE’s achievement-oriented concept to build a “four-level teaching platform”, where goals for modules, module block, module groups, and innovative applications are based on social demands. With graduation requirements as the guide, practical teaching tasks as the drive, and teachers and curriculum standards as the core, we built this platform for systematic innovation and practice.

![Figure 9. The four curriculum teaching system diagram of innovative Applied Art talents in Shandong University of Art & Design (2017)](image)

We connected education and teaching resources in the way of “students + modules + teachers”, and built a new learning ecology and teaching system by reforming the credit system. A four-level teaching platform features a teaching model centred on “continuous improvement” and a quality evaluation method based on “learning results” has been introduced:

- **Level 1:** “interdisciplinary knowledge” – an orientation level for graduation achievements based on
comprehensive knowledge. This first level focuses on government and social projects, student's social competence, as well as their ability of teamwork, leadership, design execution and management, and interaction with people.

Level 2: “field expansion” – an improvement level based on module groups. This second level highlights student abilities, their different employment needs, and enhances their social competence.

Level 3: “Curriculum complex” – a comprehensive application level based on module blocks. The third level emphasises learning and helps students develop the ability to learn independently by selecting their preferred teachers for optional modules or modules based on knowledge chains, or with supervisors from another knowledge domain.

Level 4: “scene empathy” – the basic level of design discipline based on the main modules. The fourth level helps students to learn both concrete and abstract knowledge, taps their potential, improves teacher-student interaction, and releases student’s vitality.

These four levels connect with each other. Both teaching and learning focus on knowledge and practice, so student’s innovation and practical ability can be cultivated in the learning process, which enhances their core competitiveness and social competence. Different levels are equipped with practical teaching methods with multiple measures. For example, we have implemented the “associated teaching approach” that features “graduation achievement exhibition + employment promotion” for 10 consecutive years; more than 20 of our studios (workshops) have adopted the “task-based teaching approach” where module selection is built on “studio + supervisor group + knowledge chain”; we also corporate with more than 300 century-old industries, impose transdisciplinary corporation among 12 majors based on project responsibility system, establish “professional group+industry group+enterprise group” along with innovative “umbrella form” teaching methods; accurately clarify demand, with a view of problem-orientation, highlight using design to solve problems, emphasize teaching, promote “locate industry(CC)”, “define problems(CP)”, “problem-based design(CD)”, “customized class(CC)” “4C” teaching methods. These measures run through the four-year undergraduate education, effectively alleviating the “congestion” in the training path, and improving student’s innovation and practical ability.

Figure 10. Schematic diagram of “site-type” course selection teaching method carried out by Shandong University of Art & Design (2017)
Conclusion
The solution for training undergraduate students in art and design at Shandong University of Art & Design is based on student development and their learning achievements. We have summed up the three prominent problems existing in teaching and their respective solutions. In this process, we studied the common phenomena and challenges faced by the teaching for undergraduate programmes of art and design, proposed strategies, and created an “innovative and practical teaching system” with our university’s distinct
characteristics. This system helps with the realisation of the training goals and has theoretical and practical significance.

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LEI SUN
Shandong University of Art & Design, CHINA
sunlei@sdada.edu.cn
Sun Lei, Doctor of Business Administration, Director of the Academic Affairs Office and professor at Shandong University of Art & Design, China. He is also postdoctoral researcher at University of Oxford, and visiting scholar at Peking University and Tsinghua University. He mainly teaches and researches design management, strategy and policy.