Abstract. Recognition to evaluation indicators forms the linchpin for the study or preparation of major evaluation. This dissertation has compared current major evaluation indicator systems in various colleges to extract key elements, carried out concrete analysis towards the specific evaluation practice of packaging engineering major, and provided reference and suggestion on the approaches to facilitate major development with appropriate evaluation system and conduct day-to-day routines like teaching and researching activities in a well-targeted manner.

Introduction

Majors constitute a substantial characteristic differentiating higher education from other levels, therefore the competence of major can directly affect the quality of special talents cultivated[1]. The major evaluation identifies the education capacities of majors, enhances college management, integrates the overall information related to the education process of majors, and comprehensively assesses the majors on their guidance and positioning, hardware and software condition, effect of curriculum and quality of talent cultivation[2]. Beijing Institute of Graphic Communication has achieved gradual progresses in the internal major evaluation, which involves the packaging engineering major, a municipal characteristic specialty of Beijing, as well. Following article is going to analyze the evaluation indicators and current condition of the packaging engineering major.

Evaluation Indicators & Rating Criterions

The evaluation and establishment of specific major complement each other. Major evaluation both neatly sums up the massive regular routines and effectively scouts out deficiencies to guide the next stage of major reform and construction [3].

Ministry of Education has proposed 7 1st-class indicators, 24 2nd-class indicators and 64 key audit points in the Scheme of Undergraduate Teaching Audit. Needless to say, there lies a significant difference between the subjects of undergraduate teaching audit and major evaluation, namely the major evaluation refers to the review on single major, which is a smaller and more specific range compared with the overall layout and operation of the college examined by the teaching audit. The teaching administration department and experts at Beijing Institute of Graphic Communication have put forward 7 1st-class indicators (including characteristics of the specialty), 18 2nd-class indicators and 44 key evaluation points based on comprehensive consideration and abstraction.

Self-evaluation of Packaging Engineering Major

This section is going to introduce the condition of packaging engineering major based on the major evaluation indicators of Beijing Institute of Graphic Communication and the important and
quantified rating standards for A-level. All achievements evaluated shall be acquired in recent three years.

**Major Positioning**

Three observation points are designed for the evaluation indicator of Major Positioning, including major positioning and planning of establishment & development, design of the cultivation project, and implementation of the project. Following rating standards are clearly quantified: municipal or above key laboratories, test centers and off-campus talent training bases; 95% or above fulfillment rate of fundamental and professional courses specified in the cultivation project; credits of professional courses reaching 150% of corresponding requirement; 3 or above professional academic lectures per semester.

The Printed Packaging Material & Technology Laboratory is a municipal key laboratory of Beijing, while the Comprehensive Training Center of Printing Engineering is assessed to be the experimental teaching demonstration center of institutions of higher education in Beijing. The center focuses on the development of students’ practical ability, comprehensive engineering ability and innovation ability to support the successful implementation of the packaging engineering major construction and cultivation project on the segment of practice teaching.

Beijing Artron Printing Co. Ltd. is the off-campus talent training base of Beijing Institute of Graphic Communication as well as a certified municipal off-campus talent training base of Beijing.

The fulfillment rate of fundamental and professional courses specified in the cultivation project is 100%. The elective professional courses provide 14 credits in total, which are 200% of 7 credits required for students to achieve from elective professional courses. The 7 core professional courses have completed syllabuses, calendars and plans. 27 lectures have been opened for students in recent 3 years, averagely 4.5 per semester.

**Teaching Staff**

Following rating standards are clearly quantified: school-level or above excellent teaching team; 8 or above full-time teachers; professors/associate professors accounting for 60% of the team members or above; Ph.D. accounting for 30% or above; teachers graduating from 211/985 colleges accounting for 50% or above; course evaluation by students rated 90 or above; course evaluation by on-campus visiting specialists rated 85 or above; school-level or above Master Teacher; 6 or above published teaching materials; at least 10 school-level key (or above) research projects; 15 or above indexed papers published.

Packaging engineering major is equipped with 22 teachers, consisting of 5 professors, 11 associate professors, 6 lecturers and 1 assistant teacher, which specialize in subjects included in or related to packaging engineering like the light industry technology and engineering, materials science and engineering, chemistry, materials physics and chemistry, materials science, mechanical manufacturing and automation, mechanical manufacturing and design, printing technology, oil painting, graphic design, etc. 70% of the members are engaged in senior positions. Among the teachers, there are 7 Ph.D.s (32%), 12 masters (55%) and 16 graduates from 985/211 colleges (73%).

Teachers titled with professor or associate professor give classes to undergraduates every year. Meanwhile, each fundamental or professional course is prepared with two eligible lecturers. All the core professional courses are given by professors or associate professors. The teaching team of packaging technology has been appraised as school-level excellent teaching team. All the teachers have acquired 90 or above points in course evaluation by students.

75 understudied projects are ongoing in the packaging engineering major, including 20 transverse projects and 55 vertical projects, 2 national projects, 11 provincial projects and 18 projects at municipal Party committee or bureau level. The teachers have released 34 sci-tech papers on the SCIE/SCI/EI/ISTP and other information retrieval journals as well as published 6 academic books or teaching materials.

There remains a deficiency: the lack of school-level or above Master Teacher. Packaging engineering major is not in shortage of famous teachers, given the enormous passion and energy
devoted into the teaching activities by all the teachers and their frequent appearances on the list of “the most favored and respected teachers among students”. The main attribute lies in the insufficient attention from front-line teachers to teaching awards. This evaluation has indicated the necessity to emphasize the teaching evaluation during the major establishment and to increase the incentives to Master Teacher in the management system.

Teaching Condition & Utilization

Following rating standards for this indicator are clearly quantified: formally printed experimental textbooks related to the major; 5 or above contracted off-campus practice bases; 100% application rate of online teaching to compulsory courses.

Packaging engineering stresses the management over the practice teaching, appoints practice tutors and has formulated and officially published experimental textbooks of the major. It has signed formal cooperation agreements on the establishment of practice teaching bases with 30 enterprises, among which the practice base co-constructed with Beijing Artron Printing Co. Ltd. has been certified as a municipal off-campus talent training base of Beijing.

Practice teaching of packaging engineering major is supported by the Comprehensive Training Center of Printing Engineering (the experimental teaching demonstration center of institutions of higher education in Beijing accommodating courses like Packaging Printing, Post-printing Technology, etc. and part of student practices), the Beijing off-campus talent training base, the experiment center of packaging engineering, and on-campus/off-campus practice bases.

All the compulsory courses required by the cultivation project have applied online teaching.

Teaching Establishment & Reform

Following rating standards for this indicator are clearly quantified: 8 or above published papers studying teaching reform; at least 2 approved national teaching material projects or municipal top-quality teaching material projects, or municipal or above top-quality teaching material award; 95% or above of subjects being equipped with professional textbooks; 100% excellent course rate and 60% or above school-level top-quality course rate for core professional courses; 2 or above bilingual courses; 50% or above comprehensive/designing experiment rate.

During the reform of teaching content and curriculum system, packaging engineering major has been consistently presupposing the transformation of education ideology and update of education concept, and starting from the talent cultivation mode to reform the traditional teaching content and establish scientific and modernized curriculum system. Over the past three years, 12 projects regarding the reform of teaching content and curriculum system have been approved, and 11 papers studying teaching reform have been published.

With respect to the textbook development, teachers in the packaging engineering major have led the edition of 2 national planned teaching materials in the recent 3 years, including the “Packaging Printing Technology” edited by Professor Xu Wencai that has been elected as the national top-quality teaching material. When selecting teaching materials, the major gives priority to national planned materials and textbooks carrying high reputation and favorable effect response, while applying self-designed teaching materials (including all the national planned teaching materials edited by full-time teachers) to part of the courses according to the characteristics of packaging engineering. Among the 7 core professional subjects established in packaging engineering, 2 have applied the national planned teaching materials edited by our teachers. All the professional courses have been equipped with professional textbooks, among which the planned/excellent materials account for 66.7% and self-edited materials account for 16.7%. 16.7% of courses have been equipped with foreign reference books, and there are 2 bilingual courses in total.

The system and content of the practice teaching of packaging engineering comprise 5 categories, namely course experiments, comprehensive practical courses, practical courses, skill-training course practices, and practices aiming at innovation ability.
**Major Management**

Following observation points have been specified for this indicator: management condition and effect, implementation status of quality supervision & control standards, professional ethics and dedication of teachers, disincline compliance and learning culture establishment among students, and extracurricular sci-tech and cultural activities. Following rating standards have been clarified: 2 or above teaching observation/poll activities per year; 0 teaching accident of teacher, and school-level or above professional-ethics award; 0 student cheating case.

To develop a reasonable education management institution, packaging engineering major has initiated management mode reform that advocates the teaching operation and management mode of “course-(course group)-course cluster-major”. 2 major course clusters have taken shape in the packaging engineering specialty, based on which the overall reform of teaching management and establishment will be further driven forward.

The major has fully utilized the Teaching Guiding Committee for Secondary College, the head of major and the teaching quality control group to conduct supervision and control on following five aspects, major positioning, teaching activities, practice teaching, teaching effect, and student innovation.

Teachers have been subject to meticulous scholarship and teaching/cultivating activities with no teaching accident over past three years. No student cheating has occurred.

**Talent Cultivation Quality & Social Reputation**

Following important rating standards for this indicator are quantified: 90% or above pass rates for core professional courses; students participating in competitions or scientific researches accounting for 50% or above; 1 or above national competition award, 2 or above municipal awards, 6 or above school-level awards, or 6 or above papers published; students participating in postgraduate entrance examination accounting for 10% or above.

The student performances in most years are subject to normal distribution, and the pass rates for the majority of core professional courses are above 90%. Over past three years, 87 Beijing Undergraduate Research Projects have been approved, involving over 70 tutors and more than 300 students. 183 School-level Undergraduate Research Projects have been approved, involving over 100 tutors and more than 400 students. A large number of excellent students and academic outcomes have sprung up in the researches of said projects. For instance, the paper “New Hydrothermal Synthesis Method for Preparing γ-MnOOH Crystal” formulated by Ma Lin, undergraduate student from Packaging Class 1, was awarded the “Excellent Student Paper of the Conference” and published on the “Integrated Ferroelectrics”, a SCI journal. Students majoring in packaging engineering have published 5 EI-indexed papers and 12 journal articles. The major has received multiple national awards.

Inadequacy: The postgraduate application rate of packaging engineering major maintains around 8%, which is insufficient for the rating standard of A level. Despite of the large amount of research and competition awards and the considerable academic competence of students in successive years, only a small proportion choose to take the postgraduate entrance examination, which indicates that future academic researches and teaching practices should not only emphasize the intellectual impartation but also deliberately guide and encourage students to pursue higher level of academic attainments, thus to conform to the institute’s strategy of transforming into a teaching and research university.

**Conclusion**

The study on the key indicators and rating standards of the major evaluation implemented inside of colleges under the intention to promote future construction and reform of majors contributes to the important foundation for the effective establishment of evaluation system and the scientific execution of internal major evaluation. This article has compared the indicators adopted by Ministry of Education for the teaching audit and by various colleges for the major evaluation at first, then
taken the example of packaging engineering major to illustrate important and quantified observation points in the rating standards, analyzed the causes for the deficiencies, and proposed solutions for practices ahead to enlighten the evaluation of other majors.

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