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HELLENIC REPUBLIC

H.Q.A.

HELLENIC QUALITY ASSURANCE AND
ACCREDITATION AGENCY

EXTERNAL EVALUATION REPORT

DEPARTMENT OF TEXTILE ENGINEERING

TEI PIRAEUS



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External Evaluation Committee

The Committee responsible for the External Evaluation of the Department of Textile Engineering of the Technical Institution of Piraeus consisted of the following five (5) expert evaluators drawn from the Registry constituted by the HQAA in accordance with Law 3374/2005 :

1. Prof. Dr. Christos Spitas _____ (Chairman)
 (Title) (Name and Surname)
 Delft University of Technology _____
 (Institution of origin)

2. Prof. Dr. Angelos M. Efstathiou _____
 (Title) (Name and Surname)
 University of Cyprus _____
 (Institution of origin)

3. Prof. Dr. Pelagia-Irene Gouma _____
 (Title) (Name and Surname)
 Stony Brook University _____
 (Institution of origin)

4. Prof. Dr. Elias Siores _____
 (Title) (Name and Surname)
 University of Bolton _____
 (Institution of origin)

5. Prof. Dr. Charis R. Theocharis _____
 (Title) (Name and Surname)
 University of Cyprus _____
 (Institution of origin)

N.B. The structure of the “Template” proposed for the External Evaluation Report mirrors the requirements of Law 3374/2005 and corresponds overall to the structure of the Internal Evaluation Report submitted by the Department.

The length of text in each box is free. Questions included in each box are not exclusive nor should they always be answered separately; they are meant to provide a general outline of matters that should be addressed by the Committee when formulating its comments.

Introduction

I. The External Evaluation Procedure

- Dates and brief account of the site visit.
- Whom did the Committee meet?
- List of Reports, documents, other data examined by the Committee.
- Groups of teaching and administrative staff and students interviewed
- Facilities visited by the External Evaluation Committee.

The external evaluation committee (henceforth ‘the Committee’) visited the Department of Textile Engineering (henceforth ‘the Department’) of the Technological Educational Institute (TEI) of Piraeus (henceforth ‘the Institute’) on the dates 10/6/2014 and 11/6/2014. It was met upon arrival by the head and the deputy head of the Department, and the president of the Institute, Profs. Vassiliadis, Primentas and Vrizidis, respectively.

In the two days of the visit, the Committee met with the internal evaluation unit (OMEA) and the Deputy President of the internal evaluation unit (MOΔIII), members of the faculty (ΕΠ), undergraduate students, research assistants, and support staff of various capacities (administrative and technical support staff). The EEC was shown the classrooms and laboratory facilities used for education, outreach, research, and administrative support, and the library.

A very informative discussion session was held at the end of 10/6/2014 with over 20 persons featuring alumni and students. An additional interview was held with the Technical Director of one of the existing industrial contacts of the Department. Discussions were conducted in a visibly self-reflective and constructive spirit by all persons interviewed and were open and informative.

The Committee was provided in advance of the visit with the internal evaluation report written by the Department, extensive inventories of faculty output and course-related data. In addition, the Committee requested and received paper printouts from project work by students and electronic copies of some of the presentations given during the visit.

Further, the Committee requested additional clarifications regarding the self-perception of the Department in terms of identity, mission/vision, and the relevant perceived strengths, weaknesses, opportunities and threats (SWOT analysis). In reply to this request, in-depth clarifications were provided by the Department in a dedicated session at the end of the visit of 11/6/2014, where the committee received a formal SWOT analysis by email in the morning of 12/6/2012, which was taken into consideration as well.

The documents, reports, and other data examined by the Committee were:

- Internal Evaluation Report
- Study Guide (Academic year 2011)
- Appendix to the Study Guide with 2014 updates
- Samples of students diploma theses
- Samples of graded student examinations
- Samples of course syllabi & textbooks
- Copies of oral presentations given during the site visit
- Publications and output lists of academic staff
- Published scientific papers
- Curriculum Vitae of the permanent academic staff
- Numerous leaflets and brochures describing the Department and the Institute.
- Course evaluation form templates & evaluation results
- Sample videos used for student training

In addition, the committee visited:

- The Laboratories of the Knitting section
- The Laboratories of the Spinning & Weaving section
- The Laboratories of the Dyeing & Finishing section
- The Institute's Central Library
- The Departmental educational facilities, teaching rooms and offices
- The Department's computer terminal room, where the use of industrial software was demonstrated
- The Institute's international student exchange office (ERASMUS)
- The Institute's career office
- The industrial Liaison Office

Overall, the Committee was satisfied with and commends the welcoming and cooperative attitude of the Department and Institute, who made all pertinent resources available to the needs and purposes of the evaluation.

II. The Internal Evaluation Procedure

Please comment on:

- Appropriateness of sources and documentation used
- Quality and completeness of evidence reviewed and provided
- To what extent have the objectives of the internal evaluation process been met by the Department?

The committee examined carefully the Internal Evaluation Report before and after the site visit at the Department. The committee feels that the documents and sources used were generally appropriate, but also noted some lacking aspects. For example, there was

a lack of the following elements:

- A concise, crisp and explicit identity description and related vision for the Department (including the relationships between its sections), in relation to the rest of the Institute, the industry and the society
- Comparative educational and research quality indicators with other comparable Departments among international Universities and Technological Educational Institutions
- Incomplete information on students employment
- Course and curriculum student evaluation results

The above points notwithstanding, the committee feels that overall the Internal Evaluation Report was very informative.

A. Curriculum

To be filled separately for each undergraduate, graduate and doctoral programme.

APPROACH

- What are the goals and objectives of the Curriculum? What is the plan for achieving them?
- How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?
- Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?
- How was the curriculum decided? Were all constituents of the Department, including students and other stakeholders, consulted?
- Has the unit set a procedure for the revision of the curriculum?

The Department has a long history as it was established in 1983 to serve the needs of the textile industry in Greece. The Department is situated close to textile-production enterprises and serves the broader metropolitan area of Greece's capital. Textile Engineering encompasses the processing of natural and synthetic fibers, the design and manufacturing of yarns, fabrics, and garments, as well as their current uses. The study guide for the Department includes courses that describe these materials and processes, offering both theory and lab sessions. The courses are updated to reflect the state of the art. The curriculum was reorganized and updated in 2011 in response to the new legislation.

The goals of the Department are to provide high quality and up-to-date education in Textile Engineering and its applications, as well as to cultivate a problem-solving mentality and to promote lifelong learning for its students, as these are crucial to the professional development of the graduates and the needs of the related industry. An important aspect of the curriculum is the relevance and strong interaction with industry.

The curriculum is focused on three key areas: dyeing and finishing; spinning and weaving; knitting and garment design. These areas were always maintained and are being expanded to meet the current needs of the market in relation to the economy (e.g. in knitting more emphasis is given on CAD sessions for garment patterning).

The distinct subject matter of the curriculum (textile engineering) makes this Department to stand out **as one of a kind program** across Greece. Therefore, the appropriate standards to use in the evaluation of its objectives would be to refer to long-established Textile Engineering Departments abroad. Since many of the faculty have graduated from such programs (University of Leeds, Manchester, Gent, and Bolton), it is not surprising that the Department follows a closely related study guide offering similar courses (e.g. coloration, clothing technology, fiber, yarn and fabric technology). The Department has been providing services to the textile industry from its inception.

A new law reduced the obligatory maximum number of courses to be offered and thus the original curriculum had to be revised significantly in 2011. The changes in the curriculum were decided based on the provisions of the new legislation, and they were implemented over the course of three years. It offers a strong foundation in the sciences (physics, math, chemistry) and ample of hands-on training on specialized equipment and processes. In the course of the revision, a number of specializations were dropped and the knowledge delivery has been streamlined in a single line of study, which can be tailored to some extent through the choice of offered electives.

According to the study guide, the curriculum consists of 41 courses, including a diploma thesis and an internship. The duration of the study is 8 semesters (240 ECs as per the ECTS), with a corresponding workload of 750 hrs per semester (6000 hrs in total). To graduate, each student is required to have successfully completed 36 core courses, 4 elective courses and a graduation thesis (final dissertation).

Discussions of the Committee with a group of graduates of the Department and some current students confirmed that the learning outcomes are indeed achieved. The curriculum meets its objective and goals to create a skilled work force in textile engineering, which is largely absorbed by the industry to work in various positions ranging from production engineering, to (fiber or textile or dye) quality control and fashion (garment design and production). Industry-student interaction is currently facilitated by a Liaison Office and this is a very good thing.

The Committee believes that the current streamlined curriculum helps to avoid potential confusion that would be associated with the choice among different specializations, which was reportedly the case before. At the same time, it is not clear how informed the students are when choosing their electives, as the academic staff and secretariat do seem to offer advice, but no structured mentoring/tutoring is in place.

Organized mentoring efforts are proposed that will include personal tutoring for each student throughout the studies (Recommendation 1).

The study guide can be extended to include a clearer link between the offered courses and the professional profiles/career paths resulting from following these courses (Recommendation 2).

In general, the Committee feels that the maintenance and future development of the Curriculum should be henceforth undertaken in a more structured way, in order to assure a

continuity of vision and strategy, make sure that the Curriculum remains relevant and future-proof, and to promote problem ownership. To this effect:

A student council and an alumni committee should be established, to advise the management and future strategy with regard to the Curriculum maintenance and development (Recommendation 3).

An industrial advisory board should be established, as is customary in many engineering institutions abroad, to assure that the Curriculum and its graduates remain relevant to the industry's needs (Recommendation 4).

Curriculum maintenance and development, as well as the coordination of the advisory bodies foreseen under Recommendations 3 and 4, should be led by an Undergraduate Program Coordinator, elected from and among the faculty body to work to this effect (Recommendation 5).

IMPLEMENTATION

- How effectively is the Department's goal implemented by the curriculum?
- How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?
- Is the structure of the curriculum rational and clearly articulated?
- Is the curriculum coherent and functional?
- Is the material for each course appropriate and the time offered sufficient?
- Does the Department have the necessary resources and appropriately qualified and trained staff to implement the curriculum?

During the academic year 2012-2013, the Department had a total of 480 students registered for the normal study period (v + 2 years). The total number of incoming students was 141 and the graduating class had 37 people. The average grade on the degree certificate (Ptycheion, B.Sc) was 6.76/10.0. The quality of the students, while it had declined in recent years, is now seen to improve again, the Committee was told. Some students have family ties to the profession of the textile engineer and prefer the Department for this reason and their aim is to work in the family businesses in this field. The number of graduates to the number of admitted students is relatively small for many reasons, not least that the Department was not the first choice for many of them. The positive fact is that the ones graduating can still be absorbed by the industry quite fast.

The Committee was informed that attendance to the non-compulsory theoretical lectures is on average about 30%, which raises questions as to the effectiveness of the way theoretical lectures are implemented in the Curriculum and the overall way of implementing the delivery of the concerned knowledge and competencies.

Overall, the Committee was shown evidence of a relatively smaller but healthy number of active and motivated students and a comparatively larger number of dormant students who do not attend, remain stagnant and yet keep enrolling year after year (the latter being acknowledged by the Committee as a problem typical of the situation nationwide).

In order to strengthen student motivation and participation, strengthen current efforts to promote the values of the Department to its students, e.g. by inviting experts of the field and

past graduates of the program study, organizing info-days and induction week, etc (Recommendation 6).

New/ additional measures should be taken to motivate more and to enhance active participation to the theoretical lectures, e.g. by introducing progressive assessment, personal tutoring, and or reviewing the appropriateness and perceived relevance of the lecture content (Recommendation 7).

The intrinsic competence level of students can be a strong influence in terms of how they cope with the Curriculum (which also means that students with different backgrounds may have very different interest/ affinity/ performance in the same module).

To help students achieve higher performance, it is recommended that the personal tutors (as per Recommendation 1) are given access to the ranking the Department had in the tutored student's application for entrance to the Higher Education and seek to understand and mentor them closely (Recommendation 8).

RESULTS

- How well is the implementation achieving the Department's predefined goals and objectives?
- If not, why is it so? How is this problem dealt with?
- Does the Department understand why and how it achieved or failed to achieve these results?

The graduates of the program that the Committee met with were confident and competent professionals for the most part that are employed in the field of their study. ~~And this~~ This is a very distinct positive feature of the Curriculum and the character of the Department. It is called what it is. It trains its students on what it has specified. Based on all input during the interviews, it is very successful with respect to the number and quality of graduates it feeds to the job market and industry.

According to the information provided, the average study time until graduation is between 5-6 years. This is generally normal in the context of Greek national higher education, however, the Department can and should do better in getting students through the pipeline in the specified study time (4 years), by reassessing the do-ability, from the point of view of complexity, of its Curriculum- notwithstanding any measures taken at the individual course/ teaching level (Recommendation 9).

The students felt that the Curriculum may be improved by allowing them more time on hands on training on machines and dedicated computer software (e.g. CAD-CAM). Thus, it is recommended that more emphasis should be given on developing these practical engineering skills by increasing the access to these training opportunities and possibly the related lab course hours (Recommendation 10).

IMPROVEMENT

- Does the Department know how the Curriculum should be improved?
- Which improvements does the Department plan to introduce?

The Department has very positive aspects with respect to the Curriculum. Improvements are still possible, some of which are listed in the Internal Evaluation Report. It may potentially be further improved as per the Recommendations made by the Committee given above.

B. Teaching

APPROACH

Does the Department have a defined pedagogic policy with regard to teaching approach and methodology?

Please comment on :

- Teaching methods used
- Teaching staff/ student ratio
- Teacher/student collaboration
- Adequacy of means and resources
- Use of information technologies
- Examination system

The Department has a clearly defined pedagogic policy of training Engineers (Production Engineers) for the Textile industry.

This is achieved via a combination of lecture and laboratory courses. Virtually all courses have elements of both. Lectures make use of modern methods such as PowerPoint presentations. There is an Institution-level drive for the implementation of e-learning techniques. CAL-CAD platforms are in use, and in fact the Department offers training in their use to both its students and industrial users alike.

Actual staff/student ratios are difficult to assess given the high number of a dormant student population. However, most classes seem to have an attendance of maximum 30, whereas laboratory classes are limited to a size of about 10 per group, by constraints of class size, equipment available and safety considerations.

The Department has 11 permanent members of teaching staff, 1 technician, and 31 non-permanent part-time teachers and assistants of various categories. From interviews with both past and present students, there seems to be a very high level of collaboration with their teachers, and appreciation of their efforts. Students are mostly appreciative of the assistants and part-timers.

Some Laboratories are very limited in size (e.g. chemistry related labs, weaving, knitting labs) causing several shifts of students to be required, and causing significant fragmentation of the students' daily attendance schedule and also several safety concerns. The equipment is adequate for their requirements. Ultra-modern machines sit next door to outdated ones. A major concern is the maintenance and renewal of equipment, for neither of which there is adequate funding. With only one technician, technical support is really problematic.

The Department should seek ways to secure more space for its laboratories to allow larger numbers of students to be trained simultaneously, thus allowing rationalization and defragmentation of the teaching schedule (Recommendation 11).

The Department makes good use of e-information technologies and software, and students get excellent hands-on experience with them. The Library is well-stocked with the necessary textbooks as well as having access to electronic information sources. Access to Journals is insufficient on an Institution level.

Assessment of courses has several components, usually a combination of final exams, mid-terms and problem solving 'homework'.

IMPLEMENTATION

Please comment on:

- Quality of teaching procedures
- Quality and adequacy of teaching materials and resources.
- Quality of course material. Is it brought up to date?
- Linking of research with teaching
- Mobility of academic staff and students
- Evaluation by the students of (a) the teaching and (b) the course content and study material/resources

The dual system of lectures and laboratory courses appears to serve the needs of the students well. A major constraint in designing the Curriculum was the various provisions in the relevant laws and regulations (e.g. the number of courses must be 39 plus practical training and final semester thesis). This led the Department to revise its Curriculum in 2011, which limited the number of elective courses, required ECs etc.

For each course, an outline is provided which includes textbooks and other information sources. The main learning aids are notes issued by the Instructor.

This teaching material is of high quality. The Committee saw samples from each of the three Sections of the Department. The teaching material is generally presented in an attractive and presentable way. These notes cover both the lectures and laboratories, and where appropriate also cover problem solving. The samples we inspected contained up to date information, which is renewed annually. Some of the more theoretical subjects were covered in such depth in detail, which is questionable whether the students of the caliber that are admitted can cope.

Students are familiarized with research carried out via the project in the final semester.

Mobility of students is via Erasmus and other similar schemes. At the Institute level, about 80 to 100 students are exchanged in each direction. No data was made available to the Committee, specifically for the Department.

The Committee found interviews with past and present students extremely useful. Students seem very happy with the training they receive/received. The skills they acquired are directly

applicable to the local textile industry. We The Committee also talked with a representative of a Greek (multinational) textile company which wishes to employ graduates while using the staff as consultants. The students like the breadth of the education they receive, but wish for it to go to a bigger depth. They feel they need more time in the laboratory. The Institution uses a course evaluation questionnaire. This is usually given in class. Given therefore the low attendance rates prevalent in Greek higher educational Institutions, the take up rate for the Questionnaire is expected to be low. Furthermore, students do not like to fill it in, as they feel that many questions are subjective, or are unwilling to criticize their instructors. The high number of questions is prohibitive. To make matters worse, there is no mechanism for forwarding results to the Instructor. Therefore, the usefulness of this questionnaire is questionable. The Committee was unable to identify a real problem owner for the quality assurance cycle.

The close links of the Department with Industry must be maintained and deepened. They should explore the possibility of organizing on-site visits to labs and factories to provide students with direct hands-on experience of the production, testing process, etc (Recommendation 12).

The Department already uses its connections with industry to acquire new equipment and consumables. They should explore the possibility of loans of equipment from industry. It is the responsibility of the Institution to ensure the relevant legal framework exists (Recommendation 13).

Provide the opportunity to students to make use of resources such as work platforms and laboratory equipment outside normal lab time, with the supervision of support staff (Recommendation 14).

Equipment such as OHP's or DLP's are not available in all classes or are not in good working order. This is the responsibility of the Institution to rectify (Recommendation 15).

RESULTS

Please comment on:

- Efficacy of teaching.
- Discrepancies in the success/failure percentage between courses and how they are justified.
- Differences between students in (a) the time to graduation, and (b) final degree grades.
- Whether the Department understands the reasons of such positive or negative results?

The efficacy of lecture-based teaching is good. We The Committee did not detect any duplication of effort, for example, by splitting the class in smaller groups. Laboratory classes are routinely split for safety reasons, but also because of limited physical space.

As is common in many institutions, average grades and failure rates differ between courses. This reflects the difficulty of the course and the leniency or not of the marker. There is no mechanism for ameliorating this.

Failure rates are high, varying from 20 to 40%, if not higher. Completion rates are low, given the very large pool of inactive students. Students on average take longer to graduate than the nominal 4 years. The minimum time for graduation for this Department is about 6, and the average 10 years. Mostly degrees awarded were in the 6.0 to 7.50 range of mark, with a very small number with a mark between 5.00 and 6.00, and none above 8.50 in recent years. The entry number of students is 110 to 130, and about 30 students graduate each year.

The Department is aware of this problem and the Committee feels that it is a reason of great concern and expects the Department to provide remedies.

IMPROVEMENT

- Does the Department propose methods and ways for improvement?
- What initiatives does it take in this direction?

The Department is aware of most of the issues described above and believes that teaching related problems can be solved by being allowed to increase its members of staff.

They have close links with the Textile industry which they hope to enhance. They also discussed ways to renew their equipment.

C. Research

For each particular matter, please distinguish between under- and post-graduate level, if necessary.

APPROACH

- What is the Department's policy and main objective in research?
- Has the Department set internal standards for assessing research?

The Department does not have a clear policy and no main objectives were clarified in any documents, presentations or mentioned in any other communications. The challenges linked with the development of a clear policy are mainly associated with internal to TEI cohesive strategy for Research, the Government's continuous changes in funding arrangements and focus on University hand-outs along its persistence on research students studying only at Universities. The current financial crisis and fierce competition that the Textile industry is facing globally are additional factors that contribute to the absence of clarity as to which policy is most suitable. The general approach that TEIs are usually more inclined and appropriate to providing applied research and consultancy type of collaborations is widely acceptable in the academic community. The remaining Textile industries in Greece are fewer, increasingly downsizing and focusing on niche markets. Such uncertainties in the environment have not helped the Department to formalise a specific and focused policy.

The Department should define a clear research identity for itself, such that will present a clear added value in its national and international research and industrial environment, and on this basis formulate a coherent strategic plan for the development of applied research in textile science and engineering (Recommendation 16).

The Committee advises that the Department should establish a research oriented MSc program, in order to attract and train in-house a critical mass of persons that can make possible the implementation of any long-term and sustainable research strategy, as per Recommendation 16 (Recommendation 17).

The Institution should provide the necessary funds for the purchase of additional equipment for the absolute needs of the new MSc program to be implemented by the Department in the near future. This includes the purchase of UV-vis/DRS and Mass Spectrometer equipment. Other expensive state-of-the-art equipment should be considered in close collaboration with other Departments or even neighbouring Universities (Recommendation 18).

IMPLEMENTATION

- How does the Department promote and support research?
- Quality and adequacy of research infrastructure and support.
- Scientific publications.
- Research projects.
- Research collaborations.

Although several of the interviewed staff showed enthusiasm for research, neither at the Departmental nor the Institutional level did the Committee see evidence of any systematic or structural implemented promotion or support of research.

There is no critical mass in any specific area of future textiles science and engineering, such as performance, biomedical, sensory, wearable electronics, etc.

Research infrastructure is basic and could not be considered competitive internationally. There are no facilities that can be considered substantial for analysis, synthesis or quality evaluation and testing according to international standards. Institutional funding support is not adequate to cover basic needs of annual key equipment maintenance. The laboratory conditions in certain areas must be improved so that results credibility and repeatability can be ascertained, and consequently provide staff with substantial levels of confidence to publish in reputable journals.

Scientific publication outcome in international reviewed journals is about 2.5/year (2008-2013, Internal Evaluation Report) authored by a small percentage of staff members.

Research projects listed show keen interest and involvement in staff collaborations at national and European level. It is not clear though what the benefits of the applied research nature of these projects have been for the Textile industries in Greece.

Research collaborations have been developed with individual staff members and other research organizations in Greece and Europe. However, due to any lack of cohesiveness and clear focus in research, e.g. absence of any research centre / concentration, the Department has not established any formal ongoing research links.

The Department should establish strong relationships with other staff members of other Departments within the Institute or other Institute/Universities with similar or compatible interests (Recommendation 19).

The Department should work with national and European industry to establish joint applied projects (e.g. Participate in various related European research programs within the HORIZON 2020 framework) and –in support of a long term research plan- strategic collaborations (Recommendation 20).

The Department should adopt a two-pronged approach, whereby it should strive to establish its disciplinary excellence by publishing in reputable disciplinary international journals and in parallel continue to publish in interdisciplinary fields of high relevance to textile engineering (Recommendation 21).

RESULTS

- How successfully were the Department’s research objectives implemented?
- Scientific publications.
- Research projects.
- Research collaborations.
- Efficacy of research work. Applied results. Patents etc.
- Is the Department’s research acknowledged and visible outside the Department?
Rewards and awards.

There are no clear objectives for research set by the Department, and therefore there are no quantitative measures of success. In addition, there are no benchmarks that one can apply to rank the Department against another similar one in Greece since it is the only of its kind in the country.

Scientific publications in conferences and international journals are authored by a few staff members and represent a respectable attempt considering the research environment of the TEI and the textile engineering in general, thematic area which as it is expected is limited in terms of number of journals and number of papers published internationally.

It appears that over the years there have been a number of nationally competitive research projects undertaken, but the Textile industry support is not evident from the data. Thus, the tangible outcomes of the applied research impact could not be estimated.

Research collaborations, as explained above, have been limited to rely on personal contacts, rather than on the cumulative focused strength of the Department, its critical mass, the specialised analytical facilities, and the central support from the TEI.

The efficacy of the applied research work and its socio-economic impact has neither been qualitatively nor quantitatively measured. There is a Greek patent granted in the list of publications provided, but the staff member was not present to explain any pathways to commercialisations that he has followed. There are no policies or guidelines at Department or TEI level for Intellectual Property Rights (IPR) management.

Individual staff members’ research is acknowledged through publications and citations. However, the Department does not have a clear focus in research, and consequently there is no clear research identity. No national or international research awards have been obtained.

IMPROVEMENT

- Improvements in research proposed by the Department, if necessary.
- Initiatives in this direction undertaken by the Department.

There is a number of improvements proposed by the Department aiming at raising its research profile, most revolving around internal funding support for infrastructure, space

allocation, health and safety, and PhD research students. The latter constraint is a Government policy not to allow Technological Educational Institutes to offer research degrees. This, however, should not prevent staff in collaborating with other universities in Greece or overseas to provide co-supervision.

There were at the time of the visit no substantial initiatives or clear directions in place by the Department or indeed any concrete and feasible future plans to improve research outcomes. Maintaining close contact with the Textile industry and also with Textile Fashion and Design sectors and understanding their needs could lead to external income generation, incremental growth and sustainable focus in areas that can help industry compete.

D. All Other Services

For each particular matter, please distinguish between under- and post-graduate level, if necessary.

APPROACH

- *How does the Department view the various services provided to the members of the academic community (teaching staff, students).*
- *Does the Department have a policy to simplify administrative procedures? Are most procedures processed electronically?*

The provision of Departmental services supporting teaching and research activities is conditioned by the existing structure of the Department, e.g. the ratio of temporary to permanent staff. These services include Information Technology (IT) support, administrative support, laboratory technical support, student counseling, teaching, and technical support and maintenance of research infrastructure. Some of them are provided centrally by the Institute, others depend on the volunteer contribution of temporary staff, raising concerns about their future implementation, maintenance, and upgrading.

Departmental IT support is provided on a volunteer basis by the permanent and temporary staff. Information on the Department and e-class is included, and simplified, paper-less administrative procedures are described and implemented in TEI online. The Committee believes that the resulting simplification of administrative procedures and its contribution to the public image of the Department is very important.

Overall, given the small size of the Department and despite the multiple commitments of the faculty members and the other technical and administrative personnel, there exists a very positive, collaborative, family-like atmosphere that allows the accomplishment of most day-to-day tasks.

IMPLEMENTATION

- *Organization and infrastructure of the Department's administration (e.g. secretariat of the Department).*
- *Form and function of academic services and infrastructure for students (e.g. library, PCs and free internet access, student counseling, athletic- cultural activity etc.).*

Administrative support is provided by an efficient Departmental secretariat (2 persons) in conjunction with information and procedures described on the Web. Neither complaints, nor suggestions for improvement were raised by the secretariat, teaching staff (permanent, temporary) or the students. Training of departmental secretariat is performed twice a year within the organization. The secretariat was actively praised by all the involved stakeholders, including academic staff and students for its professional and friendly attitude.

Technical support is provided by a single person. The Committee has the opinion that additional technical personnel is required in order to address the proper functioning of the laboratories but also to improve safety.

The computers and relevant software used in IT courses and in particular in the Computer Aided Design (CAD) courses are adequate.

The Committee did not find evidence of implementation of adequate safety procedures and training protocols for the personnel (staff and students) operating laboratory equipment and machinery. Furthermore, safety equipment (e.g. goggles, eye-wash, lab-coats, gloves, etc) and safety notes were not observed during the site-visit. The Committee also notes that the lack of space and tightly packed configuration of some machinery potentially adds to the occupational hazards.

The Department uses the central library that serves the whole Institute. The Institute library is functional and is housed in new buildings and facilities. The Committee was impressed by the new facilities created, in particular the students studying room.

A number of important student services, including career planning and counseling and student mobility, are provided by the Institute. The Committee did not find evidence of sufficiently interactions between the Institution's Liaison Office and the Department, in the sense that the former is addressing a much wider and non-textile-specific industrial sector, thus, it is questionable whether the two share the same network. The Committee believes that such functions are too important and specific to be delegated to the Institute.

Students' participation in mobility programs, e.g. the ERASMUS program, is limited. One of the academic staff is pursuing secondary undergraduate studies, whereas they could be extending their expertise to Post-docs or international staff exchanges.

To professionalize the task of maintaining and upgrading information on the Web, and the provision of local IT support, this should be assigned to a dedicated (additional) permanent staff member who could be shared with other Departments of the Institution (Recommendation 22).

Certain administrative work load which the Department is not well-positioned to handle should be centralized, hence transferred from the Department to the Institution level, e.g. enrollment of students at the beginning of each academic semester, non-permanent staff contracts of employment, etc (Recommendation 23).

The Committee strongly recommends that the Institution should provide the Department in the near future with additional space and suitable infrastructure for the safe operation of its chemistry related lab courses (Recommendation 24).

RESULTS

- *Are administrative and other services adequate and functional?*

See comments above

IMPROVEMENTS

- *Initiatives undertaken by the Department to improve the services provided*

The Committee could not find specific improvement proposals in the Internal Evaluation Report. Some initiatives were found to exist during the interviews, which are typically undertaken by individual members of staff on their own volition, and there is no evidence for any structured coordination or designated problem owner within the Department, besides the regular faculty general assembly.

A designated problem owner and due process/ modus operandi should be established to coordinate and implement the improvements of services provided (Recommendation 25).

Collaboration with social, cultural and production organizations

The Committee notes that the Department has developed collaborations with several civil society stakeholders and industrial partners, some of who the Committee met during its site visit (See Internal Evaluation Report).

E. Strategic Planning, Perspectives for Improvement and Dealing with Potential Inhibiting Factors

For each particular matter, please distinguish between under- and post-graduate level, if necessary.

Please, comment on the Department's:

- Potential inhibiting factors at State, Institutional and Departmental level, and proposals on ways to overcome them.
- Short-, medium- and long-term goals.
- Plan and actions for improvement by the Department/Academic Unit
- Long-term actions proposed by the Department.

The Department shows good awareness of its environment at the Institutional and State level, in terms of inhibiting factors as well as opportunities, summarised hereunder in its SWOT analysis (reproduced here ad verbatim):

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> • Μοναδικότητα στον Ελληνικό χώρο • Εξωτερικοί συνεργάτες υψηλού επιστημονικού επιπέδου • Άριστη σχέση μελών εκπαιδευτικού προσωπικού με τους σπουδαστές και τους πτυχιούχους του τμήματος • Πολύ καλές επαφές/γνωριμίες με τον κόσμο της εγχώριας βιομηχανίας και με επιστήμονες ξένων πανεπιστημίων • Συνεργασίες σε ερευνητικό επίπεδο με ξένα πανεπιστήμια στα πλαίσια Ευρωπαϊκών προγραμμάτων • Συμμετοχή καθηγητών και σπουδαστών σε προγράμματα διεθνών ανταλλαγών (ERASMUS) • Οι πτυχιούχοι κλωστούφαντουργοί έχουν διαμορφώσει άριστη εικόνα του Τμήματος στα πανεπιστήμια της αλλοδαπής • Μεγάλο ποσοστό πτυχιούχων με μεταπτυχιακούς τίτλους (M.Sc., Ph.D.) 	<ul style="list-style-type: none"> • Σπουδαστές με χαμηλό μέσο όρο εισαγωγής, χαμηλό υπόβαθρο σε βασικές γνώσεις θετικών επιστημών (μαθηματικά, φυσική, χημεία, μηχανική) με συνέπεια χαμηλότερου επιπέδου προσδοκίες για σοβαρή ερευνητική εργασία • Μεγάλο ποσοστό πτυχιούχων που δεν απασχολούνται στον ευρύτερο κλάδο • Μικρός αριθμός μόνιμων καθηγητών εξειδικευμένων στο αντικείμενο της κλωστούφαντουργίας, Υψηλή, σχετικά, μέση ηλικία αυτών • Μη παροχή δυνατότητας κάλυψης χηρευουσών θέσεων μόνιμου προσωπικού • Έλλειψη μόνιμου εκπαιδευτικού προσωπικού, άρτια κατρητισμένο, χαμηλής ηλικίας • Έλλειψη ειδικού τεχνικού προσωπικού • Λειτουργικές αντικειμενικές δυσκολίες για την παροχή εκπαιδευτικής άδειας σε μέλη του εκπαιδευτικού προσωπικού προκειμένου να μεταβούν στην αλλοδαπή για μετακπαίδευση σε νέες τεχνολογίες και προϊόντα αιχμής που σχετίζονται με τον κλάδο • Αδύναμη δημόσια εικόνα του κλάδου και του τμήματος • Έλλειψη προγράμματος μεταπτυχιακών σπουδών • Έλλειψη σύγχρονου εξειδικευμένου ερευνητικού-παραματικού-εργαστηριακού εξοπλισμού
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> • Διαπίστωση εργαστηρίων ελέγχου ποιότητας για παροχή υπηρεσιών προς τρίτους βασισμένων στην εξειδικευμένη γνώση των καθηγητών • Διοργάνωση σεμιναρίων επιμόρφωσης εργαζομένων στον κλάδο και πτυχιούχων του τμήματος ή και άλλων τμημάτων στα πλαίσια της Δια Βίου Μάθησης • Ανάπτυξη σχετικού με την κλασσική και τη σύγχρονη κλωστούφαντουργία προγράμματος προπτυχιακών και μεταπτυχιακών σπουδών στην Αγγλική 	<ul style="list-style-type: none"> • Ανταγωνισμός από αντίστοιχα ινστιτούτα της ημεδαπής και της αλλοδαπής για την εξασφάλιση πόρων • Ανταγωνισμός από αντίστοιχα πανεπιστημιακά τμήματα της αλλοδαπής • Περαιτέρω μείωση του αριθμού των μόνιμων μελών εκπαιδευτικού προσωπικού λόγω συνταξοδότησης. • Σοβαρή υποχρηματοδότηση λόγω οικονομικών συνθηκών στη χώρα

Currently the Department is by necessity preoccupied with maintaining its day-to-day operations in spite of several severe hindrances, including:

- Reduced standard of living of its staff due to recent significant salary cuts
- Lack of academic staff due to natural attrition coupled with the lack of funds to recruit new staff, and
- Lack of essential resources such as access to on-line journal repositories due to default of subscription payments by the responsible state agency.

This constant and unavoidable preoccupation with externally induced crises tends to undermine all creative initiatives. Nonetheless, the Department was able to articulate a number of short, medium and long term goals and related actions (mainly aligned to current perceived opportunities), as follows:

- Education:
 - Provision of training seminars to the industry and professionals (short term)
 - Provision of internationalised (English language) BSc and MSc study programs (medium term), in continued collaboration with national, and international (mainly EMEA) textile industry, which can competitively attract students from the Balkans, Egypt etc
- Research:
 - Creation of a recognisable and self-standing applied research programme to bind MSc textile engineering students, industrial partners and in-house academic expertise into one expert community with national, and international added value (long term)
- Other services:
 - laboratories to provide certified services to the textile industry (medium term)

To achieve these objectives, the Department requires the following supporting actions:

- Increased autonomy for planning and budget administration
- Reduction of external bureaucracy at Institutional and State level
- Increase of permanent personnel both on faculty and technical staff level
- Funding for acquisition of strategic laboratory equipment and its maintenance

The Committee notes that the presented goals and plans have merit and makes the following recommendations:

The Department should compile: i) comprehensive strategy document, starting from a clear statement of its identity, mission and vision, and SWOT analysis which would then lead to: ii) lay out in detail explicit and feasible operational goals to achieve said mission and vision, and iii) formulate an explicit action plan, including contingency plan, to achieve said goals. This document can be a solid starting point for discussions with the Institute and the State, allowing goals and progress to be agreed, measured and achieved (Recommendation 26).

The Department should create an Advisory Board to bring on board essential input from the Industry, its Alumni and its active students. This advisory Board will observe and advice on both the building and the later implementation of the Department's strategy, and will be a permanent instrument of the future operation of the Department. The Institution's Board of Directors can play an important role in steering this process (Recommendation 27).

Together with the Department staff, appropriate persons/experts from the partner-stakeholder groups represented in the Advisory Board should be invited to participate in dedicated Working Committees that will be responsible for building the strategy (as per recommendation 25), leading to a process of co-creation and shared ownership of both the problems and the solutions. This will create a constructive framework for building consensus-based high-quality solutions that have high probability to be implemented successfully and with good relevance and impact (Recommendation 28).

F. Final Conclusions and recommendations of the EEC

For each particular matter, please distinguish between under- and post-graduate level, if necessary.

Conclusions and recommendations of the EEC on:

- the development of the Department to this date and its present situation, including explicit comments on good practices and weaknesses identified through the External Evaluation process and recommendations for improvement
- the Department's readiness and capability to change/improve
- the Department's quality assurance.

The Committee is convinced that the Department of Textile Engineering has an important mission of high relevance and added value to the Greek textile industry and society. Due to its uniqueness, this Department is –as things stand- both important and irreplaceable.

Overall, the Department is delivering satisfactory results in its educational mission, with well-motivated staff and a student body that comprises a healthy number of active and motivated students, in spite of the presence –on record- of a large body of dormant students who do not attend, remain stagnant and yet keep enrolling year after year (the latter being acknowledged by the Committee as a problem typical of the situation nationwide). That said, it is clear that room for improvement exists in terms of study success. The performance is much less impressive in terms of research, but the Committee recognises that the fluid and uncertain position of the very concept of the Technological Educational Institutes in Greece over the past decades is largely the reason for this underwhelming picture- certainly, by law even now no research is explicitly required or expected.

In terms of quality assurance, the Department seems to be making positive first steps, although much more effort will be required before both the Department and the Institution can claim to have robust and effective processes in place.

The present situation and overall performance can thus generally be understood as sufficient.

Moreover, it is commendable how the staff and students work as well as they do, and with the strong motivation that the Committee observed during the evaluation, given the uncertain, chaotic, ill/ over-regulated and resource-deprived environment that they are forced to operate in.

Although the present situation can thus generally be understood as sufficient, the Committee notes that there is large room for improvement across the board. To this end, the Committee has provided a list of 28 Recommendations, which are summarised hereunder.

1. Organized mentoring efforts are proposed that will include personal tutoring for each student throughout the studies.
2. The study guide can be extended to include a clearer link between the offered courses and the professional profiles/career paths resulting from following these courses.
3. A student council and an alumni committee should be established, to advise the management and future strategy with regard to the curriculum maintenance and development.
4. An industrial advisory board should be established, as is customary in many engineering institutions abroad, to assure that would be a positive step towards refining the curriculum and its graduates remain relevant to the industry's needs.
5. Curriculum maintenance and development, as well as the coordination of the advisory bodies foreseen under Recommendations 3-4, should be led by an Undergraduate Program Coordinator, elected from and among the faculty body to work to this effect.
6. In order to strengthen student motivation and participation, strengthen current efforts to promote the values of the Department to its students, (e.g. by inviting experts of the field and past graduates of the program study, organizing info-days and induction week, etc.

7. New/ additional measures should be taken to motivate more and active participation to the theoretical lectures, e.g. by introducing progressive assessment, personal tutoring, and or reviewing the appropriateness and perceived relevance of the lecture content.
8. To help students achieve higher performance, it is recommended that the personal tutors (as per Recommendation 1) are given access to the ranking the Department had in their tutored student's application for entrance to the Higher Education and seek to understand and mentor them closely.
9. The Department can and should do better in getting students through the pipeline in the specified study time (4 years), by reassessing the do-ability, from the point of view of complexity, of its curriculum- notwithstanding any measures taken at the individual course/ teaching level.
10. The curriculum may be improved by allowing students more time on hands on training on machines and dedicated computer software (e.g. CAD-CAM). Thus, it is recommended that more emphasis is given on developing these practical engineering skills by increasing the access to these training opportunities and possibly the related lab course hours.
11. The Department should seek ways to secure more space for its laboratories to allow bigger numbers of students to be trained simultaneously, thus allowing rationalization and defragmentation of the teaching schedule.
12. The close links of the Department with Industry must be maintained and deepened. They should explore the possibility of organizing on-site visits to labs and factories to provide students with direct hands-on experience of the production, testing process, etc.
13. The Department already uses its connections with industry to acquire new equipment and consumables. They should explore the possibility of loans of equipment from industry. It is the responsibility of the Institution to ensure the relevant legal framework exists.
14. Provide the opportunity to Students to make use of resources such as work platforms and laboratory equipment outside normal lab time, with the supervision of support staff.
15. Equipment such as OHP's or DLP's are not available in all classes or are not in good working order. This is the responsibility of the Institution to rectify.
16. The Department should define a clear research identity for itself, such that will present a clear added value in its national and international research and industrial environment, and on this basis formulate a coherent strategic plan for the development of applied research in textile science and engineering.
17. The Committee advises that the Department should establish a research oriented MSc program, in order to attract and train in-house a critical mass of persons that can make possible the implementation of any long-term and sustainable research strategy, as per Recommendation 15.
18. The Institution should provide the necessary funds for the purchase of additional equipment for the absolute needs of the new MSc program to be implemented by the department in the near future. This includes the purchase of UV-vis/DRS and Mass Spectrometer equipment. Other expensive state-of-the-art equipment should be considered in close collaboration with other Departments or even neighbouring Universities.
19. The Department should establish strong relationships with other staff members of

- other departments within the Institute or other Institute/Universities with similar or compatible interests.
20. The Department should work with national and European industry to establish joint applied projects (e.g. Participate in various related European research programs within the HORIZON 2020 framework) and –in support of a long term research plan- strategic collaborations.
 21. The Department should adopt a two-pronged approach, whereby it should strive to establish its disciplinary excellence by publishing in reputable disciplinary international journals and in parallel continue to publish in interdisciplinary fields of high relevance to textile engineering.
 22. To professionalize the task of maintaining and upgrading information on the Web, and the provision of local IT support, this should be assigned to a dedicated (additional) permanent staff member who could be shared with other Departments of the Institution.
 23. Certain administrative work load which the Department is not well-positioned to handle should be centralized, hence transferred from the Department to the Institution level, e.g. enrolment of students at the beginning of each academic semester, non-permanent staff contracts of employment, etc.
 24. The Committee strongly recommends that the Institution should provide the Department in the near future with additional space and suitable infrastructure for the safe operation of its chemistry related lab courses.
 25. A designated problem owner and due process/ modus operandi should be established to coordinate and implement the improvements of services provided.
 26. The Department should compile: i) comprehensive strategy document, starting from a clear statement of its identity, mission and vision, and SWOT analysis which would then lead to: ii) lay out in detail explicit and feasible operational goals to achieve said mission and vision and iii) formulate an explicit action plan, including contingency plan, to achieve said goals. This document can be a solid starting point for discussions with the Institute and the State, allowing goals and progress to be agreed, measured and achieved.
 27. The Department should create an Advisory Board to bring on board essential input from the Industry, its Alumni and its active students. This advisory Board will observe and advice on both the building and the later implementation of the Department's strategy, and will be a permanent instrument of the future operation of the Department. The Institution's Board of Directors can play an important role in steering this process.
 28. Together with the Department staff, appropriate persons/experts from the partner-stakeholder groups represented in the Advisory Board should be invited to participate in dedicated Working Committees that will be responsible for building the strategy (as per recommendation 25), leading to a process of co-creation and shared ownership of both the problems and the solutions. This will create a constructive framework for building consensus-based high-quality solutions that have high probability to be implemented successfully and with good relevance and impact.

Members of the Committee

**TECHNOLOGICAL EDUCATIONAL INSTITUTE OF
PIRAEUS
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