Chapter - 3
Quality of Higher Education

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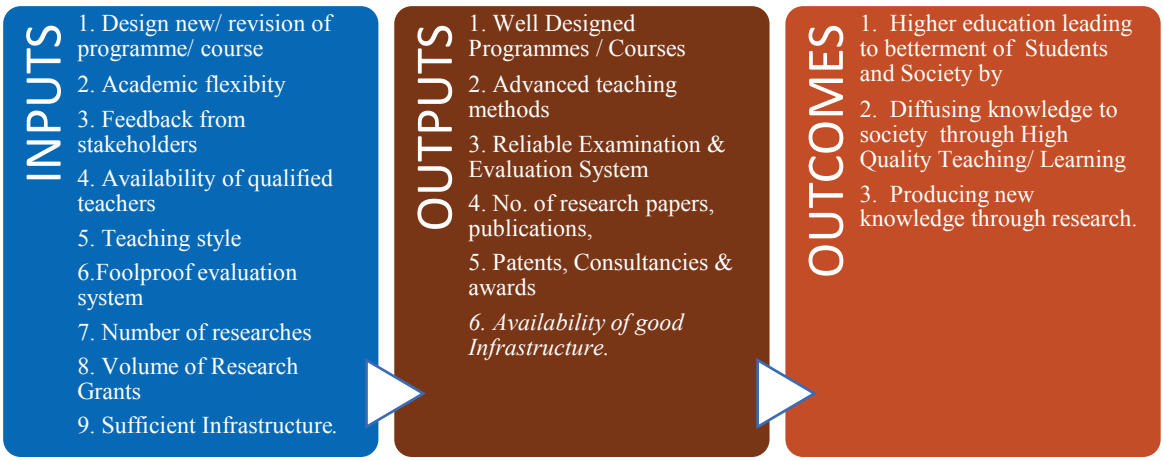
The percentage utilisation of Information and Communication Technology (ICT) facilities by teachers in teaching-learning process was low in test-checked affiliated colleges. Of the three test-checked universities, AKNU lacked sufficient academic buildings and most of the test-checked private affiliated colleges suffered with lack of infrastructure facilities.

Prescribed number of professional development programmes for faculty members was not conducted during 2014-19. Awards of international fellowship for advanced studies/research to teachers was dismal. The paper evaluation system was not reliable as many of the students who were initially declared as failed passed after revaluation with vast increase in marks.

The expectations of society from higher education can be largely met if the system of higher education is of high quality in terms of its curriculum, teaching-learning processes, research capabilities and sufficient infrastructure.



The quality of higher education is assessed by NAAC based on certain benchmarks/standards against the key indicators such as curriculum design and development, periodic revision of syllabi, effective teaching- learning processes, availability and quality of faculty, Professional development trainings, reliable evaluation process, creating new knowledge through research and sufficient infrastructure.

We assessed the performance of selected HEIs, toward imparting quality education, against the NAAC benchmarks for the above indicators. Our findings and recommendations in this context are discussed in the succeeding paragraphs.

3.1 Imparting knowledge through effective curriculum and teaching-learning processes

3.1.1 Curriculum design, development and implementation

As per NAAC Manual, curricular aspects are the mainstay of any educational institution.

It includes curriculum design, development, enrichment, planning and implementation. A university has the mandate to visualise appropriate curricula for particular programmes, revise/update them periodically, ensure that the outcomes of its programmes are defined by its councils/bodies.

In Andhra Pradesh, Andhra Pradesh State Council for Higher Education (APSCHE) plays a vital role in curriculum design and is responsible for:

- Reviewing the syllabus of existing Undergraduate (UG) and Postgraduate (PG) level programmes.
- Conducting meetings with university authorities (Dean, Academic affairs) and obtaining feedback (of teachers and students) for improvement in the existing curricular framework.
- Interacting with industry to assess the employability of students and studying the vertical ability/progression of students pursuing the programmes.

During the year 2015-16, after implementation of Choice Based Credit System (CBCS), APSCHE constituted subject committee and reviewed the syllabus and curricula for core subjects of all the UG courses. The revised curriculum was communicated to all the universities for adoption through the respective statutory bodies for implementation from the academic year 2016-17.

3.1.1.1 Process of curriculum design and development in universities

As per Andhra Pradesh Universities Act, 1991, the Academic Senate has general supervision over the academic policies of the university, to make regulations relating to courses, to advice the Board of Studies on all academic matters, *etc*.

(a) Curriculum Design and Development

The curriculum design and development in the two test-checked universities[20] were approved by Academic Senate and Board of Studies. In AKNU, the same was approved by Vice Chancellor[21] instead of senate up to February 2018.

(b) Stakeholders' feedback for designing curricular content

Curriculum design and development is a complex process of developing appropriate need based inputs in consultation with expert groups, based on the feedback from stakeholders. AU and SVU[22] obtained feedback from various stake holders' *i.e.* students, teachers' expert groups, entrepreneurs (prospective employers) while AKNU did not obtain any feedback before designing curriculum.

3.1.1.2 Revision of syllabus

Paragraph 4.3(d) of Report on 'Inclusive and Qualitative Expansion in Higher Education' issued under 12th FYP mandated that the curricula be revised at least once in every three years and the syllabi be made relevant in tune with job market dynamics and in tune with advances in research and development.

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[20] Andhra University and Sri Venkateswara University
[21] as the senate was constituted in February 2018
[22] university did not provide any records in this regard

To implement CBCS at undergraduate level, APSCHE framed syllabus in major subjects and circulated to all the universities in the State in the academic year 2015-16. The revised syllabus was being implemented from 2016-17. Further, in case of PG courses, SVU and AKNU had revised their entire syllabus in 2016-17. AU had last revised (in 2015-16) their syllabus of only 26 *per cent* PG courses (19 out of 73 courses).

3.1.1.3 Academic flexibility

Academic flexibility denotes the choices offered to the students in the curriculum offering and the curriculum transactions. There are number of ways through which academic flexibility can be incorporated. It includes introducing Choice Based Credit System[23] (CBCS), semester systems, offering new and relevant courses, *etc*. University Grant Commission (UGC) introduced the CBCS in 2015-16 for implementation by all the universities at UG level.

(a) Choice Based Credit System

We observed that all the three test-checked universities have implemented CBCS (includes semester system) in line with UGC guidelines both in respect of UG and PG courses from 2015-16 (AU) and 2016-17 (SVU and AKNU) onwards.

(b) Introduction of new courses

In respect of introduction of new UG/PG courses, SVU and AKNU had introduced eight (out of 71) and 21 (out of 30) new PG courses respectively during 2014-19, while AU has not introduced any new course. Further, in respect of UG courses, only AKNU had introduced 12 new courses (out of 67) during 2014-19.

Thus, AU had not introduced new PG and UG courses and SVU has not introduced new UG courses to give academic flexibility to students.

3.1.2 Effective Teaching-learning processes

3.1.2.1 Use of Information and Communication Technology in teaching

NAAC Manual states that technological advancement and innovations in educational transactions have to be undertaken by all HEIs, to make a visible impact on academic development as well as administration. To keep pace with the developments in other spheres of human endeavour, HEIs must enrich the learning experiences of their students by providing them with state-of-the-art educational technologies. Effective and optimal use of Information and Communication Technology (ICT) in HEIs will be able to provide ICT literacy to the campus community for resource sharing and networking, as well as adopting ICT enabled administrative processes.

The position of number of teachers using ICT in the test-checked constituent and affiliated colleges during 2018-19 is given in ***Table 3.1***.

[23] CBCS allows students to choose inter-disciplinary, intra-disciplinary courses, skill-oriented papers (even from other disciplines according to their learning needs, interests and aptitude) and more flexibility for students

Table 3.1: Teachers using ICT for teaching during 2018-19

Name of the University	AU			SVU			AKNU		
	C	G	P#	C	G	P	C	G	P
Total No. of Teachers	277	169	94	163*	63	66	83	57	151
No. of teachers using ICT in teaching	247	27	08	141	63	31	12	30	11
Percentage	89	24	09	86	100	47	14	53	07

***Source**: Information provided by test-checked Institutions*
C=constituent colleges, G=government/private aided colleges, P= private unaided colleges
#YLP degree college, Gajapathinagaram and Sri Sai degree college, Narsipatnam did not furnish the data
**Regular teachers*

The use of ICT facilities in teaching-learning process ranged between 14 to 89 *per cent* in nine test-checked constituent colleges of AU (89 *per cent*), SVU (86 *per cent*) and AKNU (14 *per cent*), while, in 26 test-checked affiliated colleges, 28.33 *per cent* teachers (170 out of 600) were using ICT facilities. It can be seen from the above table that the usage of ICT in private colleges was very less and ranged between 7 to 47 *per cent*.

3.1.2.2 Students undertaking field projects/internships

As per NAAC Manual, internships are designated activities that carry some credits[24] and involve working in an organisation under the guidance of an identified mentor. Field projects mean formal projects, in which students need to undertake studies that involve conducting surveys outside the college/university premises and collection of data from designated communities or natural places on a particular subject.

The details of students who undertook field projects during 2018-19 in test-checked universities and colleges is given in ***Table 3.2***.

Table 3.2: Students undertaken field project during 2018-19

Number of students undertaken field projects during 2018-19						
Name of the University	Constituent College (09)		Government / private aided colleges (07)		Private unaided college (19)	
	Total Students	Students participated (*per cent*)	Total Students	Students participated (*per cent*)	Total Students	Students participated (*per cent*)
AU	4,479	1,167(26)	2,199#	51 (02)	1,656^	154 (09)
SVU*	3,060	461 (15)	780#	181 (23)	1,170	Nil
AKNU	1,159	427(37)	1,349	102 (08)	2,259	202 (09)
Total	8,698	2,055(24)	4,328	334 (8)	5,085	356 (7)

***Source**: Information provided by test-checked constituent and affiliated colleges*
#Data in respect of only private aided colleges
**Information furnished by two out of three test-checked constituent colleges*
^Dr. YLP DC, Gajapathinagaram and Sri Sai DC, Narsipatnam did not furnish the information

It is evident from the above table that during 2018-19, in three test-checked universities[25], 24 *per cent* students had undertaken field projects. In five out of seven test-checked government/private aided colleges, eight *per cent* students had undertaken field projects.

[24] a credit system is a systematic way of describing an educational programme by attaching credits to its components. UGC defines one credit as one theory period of one hour per week over a semester, one tutorial period of one hour per week over a semester and one practical period of two hours per week over a semester

[25] information furnished by two (SVU College of Arts and SVU College of Science) out of three test checked colleges

In remaining two[26] colleges, no such activities were taken up. In 19 test-checked private unaided colleges, seven *per cent* students had undertaken field projects.

3.1.2.3 Availability and quality of faculty

Paragraph 7.1.2 of Report on 'Inclusive and Qualitative Expansion of Higher Education' issued under 12th FYP stated that shortage of quality faculty coupled with lack of faculty mobility across regions is a major constraint in the development of Indian higher education system.

As per NAAC manual (Para 2.4), "Teacher quality" is a composite term to indicate the quality of teachers in terms of their qualification, teacher characteristics, faculty/teacher availability, professional development and recognition of teaching abilities. Teachers must take initiative to learn and keep abreast with the latest developments, to innovate, continuously.

(a) Availability of teachers

Rashtriya Uchchatar Shiksha Abhiyan (RUSA) scheme aims to ensure adequate availability of quality faculty in all higher educational institutions. Under RUSA, States can claim funds for additional posts of faculty to enable them to achieve the Student Teacher Ratio (STR) of 20:1, if all the vacant sanctioned posts are filled by the State.

The position of number of teachers available and number of students enrolled in test-checked HEIs in 2018-19 is given in ***Table 3.3***.

Table 3.3: STR in test-checked universities and colleges during 2018-19

Name of the University	Constituent Colleges			Government Colleges			Aided Colleges			Unaided Colleges		
	S	T	STR	S	T	STR	S	T	STR	S	T	STR
AU^	4,479	277	16:1	315	18	17:1	1,884	151	12:1	1,656[$]	94	19:1
SVU	3,360	163[#]	21:1	307	10	31:1	780	53	15:1	1,170	66	18:1
AKNU	1,159*	83*	14:1	616	34	18:1	733	23	32:1	2,259	151	15:1

***Source**: Information provided by test-checked institutions*
S=Student, T=Teacher and STR = Student Teacher Ratio
^ details not furnished by the YLP degree college, Gajapathinagaram, Sri Sai degree college, Narsipatnam and AQJ degree college, Visakhapatnam
 # details of regular faculty only. Other faculty details were not provided by the university
** data furnished by three out of four test-checked constituent colleges*
[$] data furnished by four out of seven test-checked unaided colleges

As seen from the table, during 2018-19, the STR ranged between 14:1 to 21:1 in the constituent colleges; between 17:1 and 31:1 in Government colleges; between 12:1 and 32:1 in private aided colleges and between 15:1 to 19:1 in private unaided colleges under the three test-checked universities.

We have observed that in one out of nine test-checked constituent colleges, the ratio was adverse, while three test-checked constituent colleges under SVU did not furnish details of temporary teachers for calculation of STR. Further, out of 26 test-checked affiliated colleges, seven were found to have adverse ratio (more than 20:1).

[26] Government degree college (GDC), Marripalem under AU and GDC, Karvetinagaram under SVU

Thus, at university level the STR was within the norms, however, the test-checked colleges need to work to bring down the STR. The adverse STR may affect the quality of teaching-learning process and consequently impact performance of students.

(b) Availability of teachers with minimum prescribed qualifications

As per Para 3.3.0 and Para 3.3.1, of UGC Regulations[27], 2010, 55 *per cent* marks at the master's level and qualifying in the NET/SLET/SET[28] is minimum requirement for appointment as teachers in university/college/institution and the candidates, who are awarded a Doctor of Philosophy (Ph.D.) degree are exempted from the requirement of NET/SLET/SET.

We noted that all teachers in the three test-checked universities and four government colleges had prescribed minimum qualification. In 19 test-checked private colleges, 281 teachers possessed 55 *per cent* marks at Master's level and six teachers had Ph.D degree. The details of qualification of NET/SLET/SET were not furnished in respect of remaining 275 teachers. Thus, there is no assurance that the faculty had the required qualification for teaching undergraduate students.

(c) Full time teachers with Ph.D.

As per information provided by the three test-checked universities, in AU[29] and SVU[30], 100 *per cent* full time[31] teachers had Ph.D, while in AKNU[32], it was 80 *per cent* (59 out of 74). Further, in 26 test-checked affiliated[33] colleges, 15 *per cent* (88 out of 568) full time teachers had Ph.D during 2018-19.

Thus, all the teachers recruited at university level (except AKNU) had Ph.D degrees. However, in test-checked affiliated colleges, percentage of teachers having Ph.D was very low.

(d) Full time teachers who received awards, recognition, fellowships

Recognition of teachers at State, National and International levels is a marker of their teaching quality.

As per information provided, in AU, *17 per cent* (32 out of 193), in SVU[34] 45 *per cent* (122 out of 270) and in AKNU[35] seven *per cent* (six out of 86) teachers had received awards, recognition, fellowships during 2014-19. Further, in 26 test-checked affiliated colleges, none of the 600 teachers received such awards/recognition/fellowships during 2014-19.

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27 University Grants Commission (Minimum Qualifications for appointment of teachers and other academic staff in universities and colleges and other measures for the maintenance of standards in Higher Education) regulations, 2010

28 National Eligibility Test/State Level Eligibility Test/State Eligibility Test

29 all 193 full time teachers had Ph.D. degree

30 all 163 full time permanent teachers had Ph.D. degree

31 a teacher employed for at least 90 *per cent* of the normal or statutory number of hours of work over a complete academic year is classified as a full time teacher

32 data furnished by three out of four constituent colleges

33 YLP DC, Gajapathinagaram and Sri Sai DC, Narsipatnam under AU did not provide the information

34 data of all constituent colleges of the university

35 information furnished by three out of four test-checked constituent colleges

(e) Teachers provided with financial support to attend conferences/ workshops/memberships of professional bodies

To enhance quality of teaching, the teaching faculty should be provided with financial support to attend workshops/conferences/memberships of professional bodies.

As per information provided by test-checked Universities we observed that:

In AU, one[36] out of two test-checked constituent colleges, 91 out of 193 teachers were provided financial support.

In SVU and AKNU, none of the teachers were provided financial support to attend conferences/workshops and towards membership fee of professional bodies during 2014-19.

In only one[37] college (out of 26 test-checked affiliated[38] colleges), the teachers were provided financial support to attend conferences/workshops and towards membership fee of professional bodies during 2014-19.

Thus, financial support to attend conferences/workshops was not extended in two test-checked universities and 25 test-checked affiliated colleges.

3.1.2.4 Professional Development of faculty

Paragraph 7.1.3 of Report on 'Inclusive and Qualitative Expansion of Higher Education' issued under 12th FYP states that faculty development initiatives could include areas like entry level orientation, curriculum development, teaching and learning, research and innovation, engagement with social concerns and leadership development. Customised faculty development programmes may also be developed on a large scale.

Further, as per NAAC Manual (Para 2.4), teachers need to take initiative to learn and keep themselves abreast with the latest developments, to innovate, continuously seek improvement in their work and strive for individual and institutional excellence.

(a) State level status

In AP, there are two Academic Staff Colleges (ASC), one at AU, Visakhapatnam (established in 1987) and the other at SVU, Tirupati (established in 1988) sponsored by UGC under the National Policy of Education, 1986. These Centers have been established to organise socially relevant, professionally useful and academically important programmes in Inter-Disciplinary Refresher Courses, Orientation Courses, Panel Discussions, Seminars, Workshops, Guest Lectures, *etc.* on a regular basis. Details of number of programmes/courses to be conducted (as per UGC communication) and actual number of courses/programmes conducted by ASC are given in ***Table 3.4***.

[36] college of Arts, Commerce and Management
[37] 17 out of 19 average teachers during 2014-19 in PSN Murthy degree college, Turangi under AKNU
[38] total 600 teachers were available in these colleges

Table 3.4: Targets and shortfall in Professional Development Programmes (PDPs) for teachers during 2014-19

Year	No. of courses to be conducted as per UGC norm			No. of courses conducted by ASC			Shortfall in no. of courses		
	AU	SVU	Total	AU	SVU	Total	AU	SVU	Total
2014-15	25	15	40	13	6	19	12	9	21
2015-16	19	13	32	12	7	19	07	6	13
2016-17	20	11	31	3	7	10	17	4	21
2017-18	17	10	27	6	8	14	11	2	13
2018-19	20	17	37	9	11	20	11	6	17
Total	101	66	167	43	39	82	58	27	85

***Source**: Information furnished by Academic Staff Colleges*

It is evident from above table that the two ASCs have conducted only 49 *per cent* training/faculty development programmes during 2014-19. Thus, the continuous professional development programmes conducted at the State level were less than the prescribed norms of UGC.

(b) At test-checked universities and colleges level

As per information provided by three test-checked universities, the position of teachers attending PDPs during 2014-19 is given in ***Table 3.5***.

Table 3.5: Details of teachers who attended PDPs during 2014-19

Name of the University	Average no. of full time teachers	Average no. of teachers attended PDPs	Percentage of teachers attended PDPs
AU	193	42	22
SVU*	270	229	85
AKNU	69	1	1

***Source**: Information furnished by test-checked universities*
** Data of all constituent colleges*

It is evident from above table that, in AU 22 *per cent*, in *SVU* 85 *per cent* and in AKNU one *per cent* teachers attended PDPs during 2014-19. Further, in seven[39] out of 26 test-checked affiliated colleges, on an average 24 *per cent* (56 out of 235) full time teachers attended PDPs during 2014-19.

As a result, most of the faculty members of universities and affiliated colleges were not provided any opportunity to improve their teaching skills and strive for individual and institutional excellence.

3.1.2.5 Declaration of examination results and Evaluation Process

As per NAAC manual (Para 2.5), the quality of assessment process in a HEI depends on quality of questions, extent of transparency in the system, extent of development inducing feedback system, regularity in the conduct of examinations and declaration of results as well as the regulatory mechanisms for prompt action on possible errors.

[39] Dr. L. B college, Visakhapatnam and GDC, Marripalem, under AU, GDC, Karvetinagaram under SVU and SAS GDC, Narayanapuram; GDC, Ravulapalem, Aditya DC, Palakol and PSN Murthy DC, Turangi under AKNU

(a) Declaration of examination results

Timely declaration of results is extremely important, especially for graduating students as many of their post-study opportunities such as employment, further studies, appearing in competitive exams *etc.* are dependent upon their performance in the examinations. No timelines were prescribed for the declaration of results either by the universities or by the State Government.

Andhra University, Visakhapatnam

The university took time up to 135 days for UG courses and 196 days for PG courses for declaring results. The university replied (February 2020) that Optical Mark Recognition (OMR) system would be introduced from September-2019 to avoid such delays.

Sri Venkateswara University, Tirupati

The university did not provide information regarding date of examination and publication of results for UG courses, while in PG courses, the results were declared ranging from 12 to 274[40] days from last date of examination during 2014-19. During 2015-16 for 92 *per cent* courses, results were declared within two months, while in 2018-19, for 100 *per cent* courses, results were declared after two months and period of declaration of results ranged from 86 to 166 days.

Adikavi Nannaya University, Rajamahendravaram

Analysis of 20 semester exams conducted for different UG courses in general stream for the period 2016-17 to 2018-19, revealed that in respect of 15 *per cent* of exams the results were declared within 30 to 45 days, in respect of 70 *per cent* exams the results were declared in 45 to 90 days and in respect of 15 *per cent* exams the results were declared up to 125 days.

Delay in declaration of results has the potential to cause damage to the future of students as it affects their chances of securing admission for further studies in the institution of their choice, appearing in competitive exams and employment prospects.

(b) Evaluation process of answer scripts

Broadly, evaluation process involves, evaluation of answer scripts by examiners appointed by university under the guidance of subject chief and in case of any doubt or vagueness, the matter is referred to the spot chief for assessment. After the evaluation of the answer scripts, the special assistants verifies whether the marks are correctly posted question/page-wise by the examiner and the total marks recorded correctly. The entire process of evaluation leaves a lot to be desired as the marks of most of the students who opted for revaluation changed after revaluation as detailed in ***Table 3.6***.

(c) Revaluation process

Revaluation is a process in which students can request the university to revaluate/recheck their answer book/books as they believe that awarded marks were not commensurate with their expectations/performance in the examination by payment of certain fees as fixed by

[40] for the course AIHC (Archaeology) in 2014-15

the university.

As per information provided by universities concerned, the details regarding revaluation of answer books are given in ***Table 3.6***.

Table 3.6: Revaluation of answer books

Name of the University	Course	No. of students appeared in the examination during 2014-19	No. of applications received for revaluation of marks during 2014-19	No. of students whose marks were changed	Change in percentage
SVU	UG	79,213	8,929	6,137	69
	PG	15,950	DNP	DNP	DNP
AKNU	UG	3,95,591	22,326	5,404	24
	PG	36,123	8,039	5,236	65

***Source**: As per information provided by concerned university. AU did not maintain data.*

DNP - Data not provided

Andhra University, Visakhapatnam

The university stated that specific record of students who have applied for revaluation and change of marks after revaluation were not maintained. As the university did not maintain records of revaluation, we could not verify the percentage of students who applied for revaluation and the change in percentage of marks after revaluation.

Sri Venkateswara University, Tirupati

As per the information furnished by the university, marks were revised in case of 69 *per cent* students who applied for revaluation in UG courses during 2014-19, while data of PG courses were not furnished.

We test-checked some of the revaluation data and randomly selected five[41] papers of semester–I and five[42] papers of semester-III of PG examination held in November/ December-2018. Marks of 120 students were revaluated by the university in the said papers. Scrutiny of data revealed that marks were affected[43] in 90 *per cent* (108 out of 120) cases where papers of the students were revaluated. The increase of marks from original marks ranged between 20 and 866.67 *per cent*. Based on the revaluation, 81.66 *per cent* of students (98 out of 120) who were earlier declared as failed were declared as passed.

Similarly, we examined seven[44] papers of semester–I and nine[45] papers of semester-VI of UG examination held in October-2018 and April-2019 respectively. The following was observed:

- Marks of 304 students were revaluated by the university in said papers, and marks were affected in 43 *per cent* cases (130 out of 304) after revaluation.
- 16 *per cent of* students who were earlier declared as failed were declared as passed after revaluation. Of which three candidates were earlier awarded zero marks.

[41] Algebra, Business Environment and Policies, Operation Systems, Real Analysis and Statistical Computing

[42] Master of Arts (M.A), English-American literature paper, M.Sc. Statistics, Computer Programming and Data Analysis, M.Sc. Applied Mathematics-Differential Geometry, M.Sc. Chemistry-Organic Chemistry and M.Sc. Inorganic Chemistry-Organic Chemistry paper

[43] marks are affected when, revaluated marks are increased by six or more *per cent* of original marks

[44] English, Tamil, Telugu, Computer application, Fundamental of Computers, Mathematics and Political science

[45] 1.Auditing, 2. Management Account, 3. E-commerce Application, 4. Advance Numerical Analysis, 5. Advance Cost Accounting, 6. Analysis of Drugs, 7. Micro Controller and Interfacing, 8. Training and Development and 9. Laplace Transforms

- In UG courses, papers were revaluated by two valuators/examiners. In case of 55 revaluated papers, there was a difference of 10 and above marks between valuator –I and valuator-II.

Our examination of revalued papers did not inspire confidence in the evaluation process, as 16 *per cent* of students who were initially declared as failed were later declared as passed after revaluation.

Adikavi Nannaya University, Rajamahendravaram

In the University, an average of six and 22 *per cent* students who appeared for UG and PG examinations respectively applied for revaluation. Of which, marks were increased in respect of 24 and 65 *per cent* students of UG and PG respectively after revaluation during 2014-19.

The high percentage of revision in the marks after revaluation, even affecting the overall pass percentage, suggests that the evaluation systems of test-checked universities suffered from operational and monitoring inadequacies.

3.2 Creating new knowledge through effective research

Paragraph 7.1 of Report on 'Inclusive and Qualitative Expansion of Higher Education' (12th FYP) recommends that research capacities need to be consciously developed in the colleges. Colleges and their teachers should be encouraged and supported in taking up research including generation of innovative teaching-learning material. Further, paragraph 7.1.19 (a) states that multi-disciplinary mission mode research and innovation programmes should be evolved in association with arts, humanities and social sciences which should directly benefit the society at all levels and contribute to economic development.

3.2.1 Research activities and outcomes

NAAC Manual (Para 3.4) suggests that quality research outcome is beneficial for the discipline, society, industry, region and nation. Research outcomes of HEIs include research papers and publications, patents awarded, consultancies given externally, *etc*.

The details of research activities taken up in test-checked universities during 2014-19 and outcomes are given in ***Table 3.7***.

Table 3.7: Number of patents awarded/revenue generated from consultancy in test-checked universities during 2014-19

Name of University	No. of research projects		Grants received for research (₹ in crore)	Grants[46] utilised for research (₹ in crore)	No. of patents awarded	No. of JRFs, SRFs and Post-Doctoral fellows enrolled for research projects	No. of consultancies given	Revenue generated from consultancies (₹in crore)
	Sanctioned	Completed						
AU	100	22[$]	12.24	6.50	4	2134	680	3.71
SVU	74[#]	156[*]	17.70	17.70	3	992	DNP	10.51
AKNU	1	0	0.27	0.27	DNP	DNP	Nil	Nil

***Source**: Information provided by concerned university*
$ in which seven projects were sanctioned before 2014-15
**including research projects sanctioned before 2014- 15, [#]sanctioned, DNP : Data not provided, JRF: Junior Research Fellows, SRF : Senior Research Fellows*

[46] test checked universities received grants from different funding agencies *i.e.* UGC, ICSSR, MHRD, *etc*.

3.2.1.1 *Number of Research activities undertaken*

It can be seen from above table that, AU had completed 22 out of 100 research projects duly utilising the grant of ₹6.5 crore and remaining 78 projects were still ongoing as on March 2019. SVU completed 156 research projects while, AKNU had undertaken only one research project which was scheduled to be completed by March 2020.

Similarly, two (BT College[47] and GBR DC, Anaparthi[48]) out of 26 test-checked affiliated colleges were sanctioned research grant of ₹8.80 lakh for research projects. An amount of ₹4.70 lakh was released to the colleges.

3.2.1.2 Research outcomes

It is evident from the ***Table 3.7***, that during 2014-19, AU registered four patents in science stream, enrolled 2,134 JRFs/SRFs/Post-Doctoral fellows and provided 680 consultancies and generated revenue of ₹3.71 crore. The SVU registered three patents, enrolled 992 JRFs/SRF/Post-Doctoral fellows and generated revenue of ₹10.85 crore through consultancies. In AKNU and 26 test-checked affiliated colleges no patents were registered, nor any revenue was raised through consultancies.

As evident from above, there is a need to encourage research activities particularly in affiliated colleges in the field of arts, humanities and social sciences which should directly benefit the society and contribute to economic development.

3.2.1.3 Teachers contributions to Research

The strategic framework of 12th FYP seeks to bring excellence in higher education by building synergies between teaching and research to promote excellence in both.

(a) Number of research papers and books published per teacher

The details of number of research papers published in UGC notified journals and number of books and chapters published in edited volumes/books for test-checked three universities during 2014-19 is given in ***Table 3.8***.

Table 3.8: Number of research papers published and number of books and chapters in edited volumes/books published during 2014-19

Name of the university	Average number of full time teacher	No. of teachers who were given seed money[49] for research	Papers published in UGC notified journals		Books & chapters in edited volumes/published and papers in national/international conference proceedings	
			No. of papers published	No. of papers published per teacher	No. of books & chapters in edited volumes/ Published	No. of Books & chapters in edited volumes/ published per teacher
1	2	3	4	5 (col.4/col. 2)	6	7 (col.6/col.2)
AU	193	Nil	1,385	7.17	308	1.59
SVU#	270	Nil	20,055	74.28	793	2.93
AKNU	69	Nil	220	3.19	26	0.40

Source *: Information furnished by the universities*
 # Data pertains to all constituent colleges of SVU, apart from the general stream colleges

[47] the college sanctioned ₹2.80 lakh for research project 'Analysis of soil and water in Madanapalle area of Chittoor district', out of which ₹2.30 lakh were released during 2014-19
[48] the college sanctioned ₹6.0 lakh for research project 'Impact of food security scheme on Dalits in rural areas of AP', out of which ₹2.40 lakh were released during 2014-19
[49] funds provided to a teacher or a group of teachers by the institution to get the research initiated to facilitate the preparation of formal research proposal for funding

It is evident from above table that during 2014-19;

Test-checked universities

The number of papers published in UGC notified journals per teacher varied from three in the case of AKNU to 74 in the case of SVU during 2014-19. Similarly, papers published in national/international conferences varied from 0.4 per teacher in the case of AKNU to 2.93 in the case of SVU for the period 2014-19.

Test-checked affiliated colleges

Out of 26 test-checked colleges, teachers of only two colleges contributed in these aspects. In BT college, Madanapalle, an average of 2.72 research papers per teacher were published in UGC notified journals and an average of 0.15 books and chapters in edited volumes/books in national/international conference proceedings and in GBR college, Anaparthi, two papers[50] were published in UGC notified journals.

(b) Number of teachers awarded international fellowship

In AU, one *per cent* full time teachers were awarded international fellowship for advanced studies/research, while in SVU and AKNU, no full time teachers were awarded international fellowship for advanced studies/research during 2014-19. Further, in 26 test-checked affiliated colleges, none of the teachers were awarded international fellowship for advanced studies/research during 2014-19.

3.2.2 Collaborative and Extension Activities

3.2.2.1 Collaborative activity of industry-academia connect

Academia and Industry share a symbiotic relationship. Engagement between universities and industries carry the idea of mutuality and sharing of knowledge and expertise.

As per paragraph 3.7 of NAAC Manual, through collaboration, the HEIs can maintain a closer contact with the work field. It helps to keep the academic activities in the HEI in a more realistic perspective and expand the scope of learning experiences for students. Collaboration can be sought with academic institutions or industry or other agencies of professional and social relevance. The range of activities could include training, student exchange, faculty exchange, research, and resource sharing, among others. For making collaborative endeavour impactful it is necessary that there is a formal agreement or understanding between the institution and other HEIs or agencies for such activities.

We noted that AU had executed 119[51] Memorandum of Understandings (MoUs), SVU[52] executed 264 MoUs and AKNU executed seven MoUs for collaborations with institutions of national/international importance, other universities, industries, *etc*. during 2014-19. However, no such MoUs were executed during 2014-19 by 26 test-checked affiliated colleges.

[50] 'Impact of food security scheme on Dalits in rural areas of AP'
[51] data for 2015-16 not provided by the university
[52] information of all constituent colleges

3.3 Infrastructure

As per RUSA-2.0 guidelines, the critical infrastructures were technologically enabled classrooms, automation of Library, availability of e-resources, adequate classrooms, auditorium, sport facilities, hostel (separate for boys and girls), converting existing buildings to disabled friendly, *etc.*

3.3.1 Availability of ICT facilities and student-computer ratio

The use of Information and Communication Technology (ICT) in teaching has been already discussed in this report (*paragraph 3.1.2.1*). In this section, we discuss the availability of the inputs that are required to enable the faculty to utilise ICT as a tool for imparting education.

The position of the percentage of ICT enabled classrooms and student - computer ratio in the test-checked universities during 2018-19 is given in ***Table 3.9***.

Table 3.9: Percentage of ICT enabled classrooms and student-computer ratio in the test-checked constituent colleges of the selected universities

Name of university	Percentage of ICT enabled classrooms			Student-Computer Ratio		
	Total number of classrooms	Number of classrooms with ICT	Percentage	Total number of students enrolled	Number of computers in working conditions	Student-Computer Ratio
AU	177	78	44	7,551	382	20:1
SVU	116	49	42	3,360	264	13:1
AKNU	65	6*	9	1,122	110	10:1

***Source**: Information provided by concerned universities*
** Only two out of four test-checked constituent colleges had ICT enabled rooms*

(a) ICT enabled classrooms

Test-checked universities

It can be seen from the above table that in AU and SVU, the availability of ICT enabled classrooms was 44 and 42 *per cent* respectively, while, in AKNU it was only nine *per cent*.

Test-checked affiliated colleges

In AU, eight (9.9 *per cent*) out of 81 classrooms were ICT enabled in nine test-checked colleges during 2018-19. In SVU, only 27 (22.88 *per cent*) out of 118 classrooms were ICT enabled in seven affiliated colleges during 2018-19. In AKNU, only 12 (12.5 *per cent)* out of 96 classrooms were ICT enabled in five[53] out of 10 test-checked colleges. The ICT facilities were not available in 48 classrooms in remaining five test-checked colleges.

(b) Student-Computer Ratio

Test-checked Universities

The student-computer ratio in all three test-checked universities *i.e* AU, SVU and AKNU was 20:1, 13:1 and 10:1 respectively during 2018-19.

[53] GBR degree college, Anaparthi ; SAS Government degree college, Narayanapuram ; Government degree college Ravulapalem ; Aditya degree college, Palakol and PSN Murthy degree college, Turangi

Test-checked affiliated colleges

In AU, the student-computer ratio in eight[54] test-checked affiliated colleges ranged between 1:1 and 21:1. Even though, SV degree college (out of the eight colleges) had student-computer ratio of 10:1, the computers were not in working condition. Further, there were no computers in one[55] college. In SVU, the student-computer ratio in seven test-checked affiliated colleges ranged between 4:1 and 9:1. In AKNU, the student-computer ratio in ten[56] test-checked affiliated colleges ranged between 5:1 and 15:1.

The student-computer ratio of 10:1 as set by NAAC was not maintained by AU and SVU and was 20:1 and 13:1 during 2018-19. However, all the nine test-checked constituent colleges and 17[57] out of 26 test-checked affiliated colleges had student-computer ratio of 10:1 or less during 2018-19.

3.3.2 Availability of infrastructure facilities

The availability of infrastructure in the HEIs was assessed based on norms fixed by UGC (Affiliation of colleges by University) Regulations, 2009. The regulations specify requirement of space for lecture/seminar rooms, library with a minimum 15 square feet per student and laboratories with 20 square feet per student. However, APSCHE prescribed 600 square feet for classroom and laboratories irrespective of class strength. In test-checked constituent colleges of AU and SVU, lecture rooms, laboratories were available as per the norms prescribed by UGC/APSCHE. In AKNU there were inadequate classroom facilities in University College of Arts and Commerce pending construction of building. As a result, classes were running on shift basis.

As per the norms, library with at least 1,000 books, laboratory equipment as prescribed by university or regulatory body concerned should be made available. The universities were equipped with varied number of books in the central library as per the UGC Regulations, 2009 and were maintained in good condition during 2014-19.

In two universities AKNU and SVU[58] and their 16 affiliated colleges had no ramp and lift facility for differently abled students.

We carried out joint physical inspection of 26 test-checked affiliated colleges to check the availability of infrastructure like college building, library, laboratory, furniture, *etc.* The availability of these facilities in the test-checked colleges are discussed below:

(a) Availability of land in affiliated colleges

As per APSCHE norms, the educational society has to possess an area of one acre where there are 1,000 students and two acres, where there are more than 1,000 students (in three urban agglomerations of Vijayawada, Visakhapatnam and Guntur). In other places in the

[54] two affiliated colleges, *viz*. Sri Sai degree college, Narsipatnam and Dr. YLP degree college, Gajapathinagaram did not provide the data

[55] Sri Vasavi Vignana Mandali degree college, Visakhapatnam

[56] two affiliated colleges, *viz.* JC degree college, Mandapeta and Annapurna degree college, Bhuvanapalli had no computers

[57] computers were not in three colleges; two colleges did not furnish the data and in four colleges, the student-computer ratio was above 10:1

[58] in College of Arts (SVU) in six departments (i) Hindi (ii) Urdu (iii) Tamil (iv) Population Studies (v) History and (vi) Ancient Indian History, Culture & Archeology running on first and second floor

State, the educational society has to possess an area of two acres, where there are 1,000 students and four acres where there are students more than 1,000 for the proposed private degree college. The total extent of land mentioned above shall be provided at a single place only and it should be located at a place not more than 30 kms from the proposed college within the same mandal.

Andhra University

Physical inspection of the test-checked private unaided and aided colleges revealed that only one aided college[59] had land as per APSCHE norms. Further, in seven private affiliated colleges, only one college had land in the same mandal.

Sri Venkateswara University

All six test-checked private unaided and aided colleges had their own land as per APSCHE norms.

Adikavi Nannaya University

Physical inspection of (eight) test-checked private unaided and aided colleges revealed that only one private aided college[60] possessed land as per APSCHE norms.

(b) Accommodation status of the colleges

As per APSCHE guidelines/norms, the requirement of space/plinth area for building is prescribed as a minimum of 8,000 square feet and 6,000 square feet in urban and rural areas respectively and congenial for running an educational institution. Further, APSCHE has prescribed five years' time period for the functioning of the affiliated colleges in leased accommodation. However, many colleges were functioning in the leased accommodation for more than a decade.

Andhra University affiliated colleges

In the nine test-checked colleges we noticed that;

- Only three colleges[61] were running in own accommodation.
- Two colleges[62] were running at different locations other than registered location.
- Five colleges [63] had less than the prescribed area of below 8,000/6,000 square feet (urban and rural areas respectively) or were running in temporary sheds or dilapidated building or in shifts against the APSCHE guidelines. Out of these five colleges, two colleges were running in commercial complex. The colleges did not have own buildings even after 10 years of establishment and were running in insufficient, congested and dilapidated buildings.

[59] Dr. LB degree college, Visakhapatnam
[60] GBR degree college, Anaparthi
[61] Dr. LB college; GDC, Marripalem and Gowri degree college, Visakhapatnam
[62] Dr.YLP degree college, Gajapathinagaram and AQJ degree college, Visakhapatnam
[63] S.V degree college, Sri Uma Bharati degree college, Vasavi Vignana Mandali degree college, Sri Sai degree college, narsipatnam and Dr.YLP degree college, Gajapathinagaram

Picture 1: Vasavi Vignana Mandali degree college, Visakhapatnam in dilapidated condition.

Picture 2: Government Women degree college, Marripalem, Visakhapatnam District without furniture

Sri Venkateswara University affiliated colleges

In seven test-checked colleges we noticed that;

- Only three colleges[64] were having own building.
- Three colleges[65] were not having room size as per APSCHE norms and
- One[66] college had building area of 3,960 square feet against the requirement of 6,000 square feet.

Adikavi Nannaya University affiliated colleges

Five[67] out of ten test-checked colleges had their own buildings and remaining five colleges were functioning in rented building even after 10 years of establishment.

(c) Library facilities

As per UGC Regulations, 2009, library is to be equipped with at least 1,000 books or 100 books of different titles on each subject along with separate book bank facility to SC/ST students. Physical inspection of the test-checked colleges revealed the following;

Andhra University affiliated colleges

Out of nine test-checked colleges, only two colleges[68] had library facilities and remaining seven colleges had no libraries.

Sri Venkateswara University affiliated colleges

Out of seven test-checked colleges, one college[69] had library with less than 50 books. Further, in two colleges[70], separate library room was not available, and the books were kept in the room of the Principal and computer lab. There were no library rooms in the remaining colleges.

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64 Vedanarayana degree college, Narayayanavanam; GDC, Karvetinagaram and BT College, Madanpalle
65 Madhurai Meenakshi DC, B. Kothakota; Sri Srinivasa DC, Chandragiri and Sri Chaitanya DC, B. Kothakota
66 Sri Srinivasa degree college, Chandragiri
67 two Government, one private aided and two private unaided
68 Dr.L.B. degree college and Sri Gowri degree college, Visakhapatnam
69 Vijayalakshmi degree college
70 Sri Srinivasa degree college and Madhurai Meenakshi degree college

Adikavi Nannaya University affiliated colleges

Out of the ten test-checked affiliated colleges, only four colleges[71] had sufficient library facilities (books and space), remaining six colleges[72] either had no libraries or had libraries with lesser number books than prescribed as per the UGC norms.

(d) Laboratory facility

Andhra University affiliated colleges

Laboratory facilities were available in seven out of nine test-checked colleges. Of these seven colleges, in three colleges[73], labs were established in small rooms of 100-150 square feet as against 600 square feet as mentioned in the APSCHE guidelines. Further, in remaining two[74] colleges, where laboratories were not available, students of one college (Government women's college, Marripalem) had to travel 12 Kms to avail lab facilities at Government Degree College (GDC), Narsipatnam.

Sri Venkateswara University affiliated colleges

Out of seven test-checked colleges, lab room size in one college[75] was 500 square feet against 600 square feet as per APSCHE guidelines. There were no lab rooms in the remaining colleges.

Adikavi Nannaya University affiliated colleges

Lab facilities were available in all ten test-checked colleges, however, in five colleges[76] labs had less than the prescribed area of 600 square feet.

(e) Sports facilities

As per the APSCHE guidelines, the educational institutions which do not have the required land within the premises of the proposed college building will have to make available gymnasium/recreation and games facility to its students by providing separate built up space and equipment for this purpose in a public place *e.g.*, Municipal play ground or in another educational institution by having necessary tie up arrangements with concerned management within a distance of five km. of the college premises along with a bus facility for transportation of the students whenever required.

Seven[77] out of 26 test-checked affiliated colleges had their own playground, while two[78] colleges were using village playgrounds for sports activities.

When issues related to infrastructure (building, library, lab, *etc.*) were brought to notice of the respective universities, it was replied[79] that the observations would be communicated

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71 GBR aided college, GDC, Ravulapalem; SAS GDC, Narayanapuram and Aditya DC, Palkol

72 JC DC, Mandapet; PSN Murthy DC, Turangi; Annapurna DC, Bhuvanapalli; Vivekananda DC, Jangareddygudem; Sri Deepthi Mahila DC, Malikipuram and Jasti Bullemma DC, Morampudi

73 S.V. degree college, Sri Umabharati degree college and Sri Vasavi Vignana Mandali degree college

74 Government Women degree college, Marripalem and Sri Sai degree college, Narsipatnam

75 Sri Chaitanya degree college, B. Kothakota

76 JCDC, Mandapeta, Annapurna DC, Bhuvanapalli, Vivekananda DC, Jangareddygudem, Sri Deepthi DC, Malikipuram and Jasti Bullemma degree college, Maredubaka

77 Dr. L.B college, Vedanarayana degree college, Narayanavanam, BT college, Madanapalli, GDC, Karvetinagaram, Vijayalakshmi degree college, Srikalahasti, GBR degree college, Anaparthi, SAS GDC, Nagarayapuram and GDC, Ravulapalem

78 Sri Chaitanya degree college and Madhurai Meenakshi degree college, both at B. Kothakota

79 by AU and AKNU in February 2020 and by SVU in February 2021

to the respective affiliated colleges and necessary action would be initiated to follow the norms.

Lack of sports and other facilities such as labs, ICT facilities and library in the test-checked affiliated colleges may impact the teaching-learning process and overall holistic development of students adversely and compromise the quality of education.

Recommendations:

1. ***The State Government may ensure that the universities put in place a reliable evaluation system and may also prescribe specific timelines for declaration of results.***
2. ***The State Government should conduct relevant professional development programmes for continued professional development of faculties and encourage the teachers to participate in these programmes.***
3. ***For effective teaching-learning process and to keep pace with technological advancement in Higher Education, the State Government may take steps for implementation of Information Technology solutions in all Higher Education Institutes.***
4. ***The State Government should ensure availability of adequate basic infrastructure facilities like buildings with sufficient lecture rooms, laboratories, libraries and furniture in all the Higher Education Institutions as per the prescribed norms.***