

02/80/05/30

EDITED EXCERPTS OF AN ADDRESS BY PRIME MINISTER
LEE KUAN YEW TO UNIVERSITY STAFF AT THE
SINGAPORE CONFERENCE HALL ON TUESDAY 20 MAY 1980

You have read minutes of the meeting I had with the Heads of Department on 9 May, with statements by Deans of the University of Singapore and of the University of Nanyang on what their staff thought of the problems they expected on merger. You have also read four tables. I propose to highlight those parts which bear repetition.

Let me put the problems in perspective. From Table 4, you can see that the merger involves less than half of NUS staff - 307 out of 671. Out of those involved, only 113 are from NU.

Table 1 shows how significantly NUS facilities have to expand to meet manpower needs. NUS must have 1,700 teachers in 1985, about three times the present combined SU and NU staff. There is a place for every NU teacher. Naturally engineering teachers lead the situations vacant list. The

number of engineering graduates must more than double, increasing to 214.0% by 1985, and 233.5% by 1990. The Ministry of Trade and Industry did not consider it necessary to make individual projections for Arts/Social Sciences, Science, and Business Administration. These were considered to be "interchangeable" disciplines for our manpower needs. The departments being merged are the less important at our present stage of economic development. The public debate on the merger, from a national viewpoint, totally missed the point. If, instead of merger, the NU Council had decided to restart NU, NU would still not produce the type of graduates essential for the restructuring of our economy.

Let me emphasise that every faculty is important to those teaching in it, to students taking courses in it. The present priorities, however, for training manpower to meet the needs of the economy are Engineering, Management Studies (Economics, Accountancy, Business Administration), Medicine, and Law. These key faculties are not affected by merger. Merger had to be seen in this perspective.

Without imported high-level manpower we would not have made the grade. At the moment, there are approximately 20,000 employment pass holders, Caucasians and Asians. Of these, 3,000 are engineers. Others are

managers, bankers, accountants, architects etc. If we remove them, the economy of Singapore will subside, like four punctured tyres.

In 1978, the World Bank wanted to reclassify us out of "developing country" to "developed country" status and hold back our share of the gold profits the World Bank was making by selling gold at market prices. They need not pay back to developed countries their share of the gold profits. We demonstrated to the satisfaction of World Bank officials, who went through the figures, that without the foreign investments and the foreign professionals and workers, our economy would go down by 18% in our GNP. So we kept our developing country status.

In 1975, I started taking a personal interest in education after our more pressing problems had been surmounted. In 1975, I sent Kwan Sai Kheong then Permanent Secretary in the Ministry of Education to SU as VC. It is a long difficult process to put education right, starting all the way down from primary one, with four language streams, inadequate teachers, badly structured curriculum, and mismatch of two syllabuses of two different language streams into one combined syllabus to achieve bilingualism. It took four years to get the problems in the schools untangled. In 1979, Dr Goh's report, setting out basic fundamental changes to the education system was debated and accepted. It

should bear fruit during the next 10 years and beyond. First, I had to clear the political debris of old language and culture battles.

In the universities, I had made a tentative move in 1978 with the Joint Campus. At the time, I believed we could restart NU. As I went into the details -- what was being taught in NU and what kind of graduates we require, what kind of teachers we needed, and in what numbers - I discovered the figures did not match. The arguments have been public. The political issue had been resolved. The academic problems are a long way from solution.

Last year, in January and February, I met two groups of about 20 university teachers each - one at Kent Ridge, another at the Joint Campus in Bukit Timah. The VC had chosen the more promising teachers across all disciplines to give me a feel of what our professors and lecturers are like, their quality of mind, and to listen to their ideas on how to make SU an institution of excellence. They gave me written submissions before the meeting. After an afternoon's discussion, they followed up their thoughts with another considered submission. I read every submission for useful ideas, and an assessment of how open their minds were to new ideas that arose from the discussions. As I expected, I found more promising and lively minds at Kent Ridge, the teachers in the professional courses, than at the Joint Campus at Bukit Timah.

I probed further to discover teaching and examination standards. I called for external examiners' reports. Some external examiners were very good. They took their work seriously. I have time to cite only two of them tonight. In 1979, the man who examined for Architecture said: "The tutorial system seems somewhat loose and with staff uncommitted to the system, I can realise how difficult this is to manage although the interest is excellent. In several cases, I found the staff's preliminary reports unacceptable, permitting students to proceed with fundamental errors in construction, circulation and planning, etc."

He also remarked: "From the results of the final year and I am sure the other external examiners will not disagree with me, there seems to be a general lack of rigour in most of the projects."

On failure rate, he said: "In the end, 24 students passed, which constituted a failure rate of 43%, which is exceedingly high, and of particular concern for me, even given the fact that supplementaries were given. The question of 4½ years was again brought up as being insufficient time to complete their projects satisfactorily."

I had met a stimulating professor in Architecture at Kent Ridge in January last year. He made a telling point, that we were choosing students blind, by 'A' level results - through conversion into points for the computer! That does not reflect a man's ability for conceptualisation of space and forms. He proposed students should be allowed to change courses during or after their first year, if they were found not suited for their courses. It is a proposal worthy of serious consideration. My son's contemporary, who won a scholarship to do Architecture in Cambridge, was asked to submit a portfolio of drawings. He was admitted after they had judged his artistic and conceptual abilities. One drawing was a bicycle. It seemed that the way a person draws a bicycle gives an assessor a measure of whether besides being an artist he also had a mind for the structural arrangements of a bicycle which will function.

Alas, we were choosing our architecture students by points on a computer! An Associate Professor in Dentistry told me in January: "We were choosing dentists likewise totally disregarding the dexterity of the student - the critical factor." Can you imagine anybody more terrifying than a dentist without a delicate touch.

Today, the HDB has 60 architects. They are all competent; but few have the flair for artistic expression. So we have had to look out and select

architects with that flair. And in our private sector, we have found that Filipino and Thai architects have this quality. Their schools of architecture knew how to choose the people with the right aptitudes to be architects.

Now, a Building Department external examiner's report in 1979: "In part, it is caused by the structure of the syllabus, which is based on a traditional and somewhat outdated analysis of the building process." He observed: "The subject of quantity surveying concentrates to a large extent on the Singapore SMM, which adopts a traditional and by UK standards an outdated approach to bills of quantities." He said: "It is impossible to give sensible consideration to such a range of topics and in practice the course reflects the specialisation of the part-time lecturer, who teaches the subject. This has the effect of giving an undue emphasis to income tax law. "Because the part-time lecturer was an income tax lawyer, students in Building have been over-taught on income tax

law.

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The examiner was on our side: "Clearly the local (construction) industry has served Singapore well in the past, in supporting a remarkable rate of development. However, the orthodox procedures on which this development is based on increasingly being questioned by the industry's major clients in the UK and elsewhere. A similar concern in respect of their traditional procedures is

evident in North America. Recent studies have identified the emergence of new management-based approaches to large and complex international construction projects in response to clients' demands for more control and certainty. It would seem to be unlikely that Singapore designers and managers will not face the same kind of pressure from their own clients. Indeed, there is evidence that Japanese construction managers are making inroads into the local industry. Also, there is evidence that local architects and quantity surveyors are already facing criticism from clients in respect of their methods and procedures." His conclusion: "It seems likely that this work will not be done unless the university provides some specific encouragement to the staff who are already very fully occupied with their existing teaching responsibilities. Somebody, alternatively, could start to look outward and perhaps to help prepare the Singapore construction industry for the international challenges which may lie in the future."

I asked what was done to follow up this report. Nothing yet. Was there no interest or no capability? Perhaps the deans, professors, senate and council had not expected the prime minister to chance upon these reports and to ask for action.

I have another example of out-of-date content of teaching. Several years ago, my daughter, an industrious medical student, had to do SMPH (Social

Medicine and Public Health). She ran around some kampung testing their water, checking their sanitation and drains and checking the illnesses which afflict kampung dwellers. Gradually, she lost interest. It was irrelevant to what she would have to do when she qualified. I discussed the matter with a friend, a former professor. He explained, angrily, that he had tried to get this course changed, unsuccessfully. I decided to intervene. We do not have a vast countryside. In another seven years, there may not be a kampung left in Singapore. What Social Medicine and Public Health must teach is how to improve the health of our one-room flat dwellers. Is there enough ventilation? Do they get claustrophobia? What kind of diseases and psychological illness plague people in such homes?

In February 1977, I suggested a review. A professor from the University of London was invited to study the matter. He came. Nothing came out of the report.

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However, a survey was conducted by the Medical Faculty. I asked for the results on SMPH: "A number of the graduates said the course was deficient in the social aspects - no study of effects of high-rise living, and contain too much on public health items like sewerage and sanitation. They were also unhappy with having to learn the mathematical details for computing statistics." Can we not keep abreast with changing times? No subject is static; no teaching can be stagnant.

The Medical School began 75 years ago. It is the only Faculty which is capable of self-renewal - from student to doctor, to professor, to new students. It does not lack brain power because our best brains have gone into medicine. Yet we are not keeping abreast with the times.

We are no longer an entrepot economy. For example, we are about to build a \$7-8 billion mass rapid transit. Our architects, our engineers, our construction workers are all less than adequate for the job. Who trains them? How does any man learn? He can learn either by experimenting by himself; in that case it may take Singapore a few thousand years, starting with the rediscovery of the wheel to get to the jet aircraft; or he can start off from where others have left.

I once discussed the problem of teaching with a retired German General. He had reviewed our troops on field exercises. He explained vividly how you teach a soldier, indeed anybody. He said lecture to a man and he will absorb 10%. Provide audio-visual aids to illustrate and demonstrate to him, and he will absorb 30%. Get the man to do what he has been shown, e.g. dismantle the gun, clean it, reassemble it, fire it, dismantle, clean it, and so on, again and again, he will absorb 95%. Get him to do it in complete darkness - blindfold him - now dismantle, assemble, fire; he will get up to 99%. Practise it weekly and he will maintain his skills at 99% or reach 100%. Stop practising for two months and he will go down to 90%. "It's like a golf swing," one officer said to him. The General replied: "Exactly, like a golf swing." To have the timing and the rhythm and the touch right means proper instruction for a proper swing and constant practice. This is what our university teachers have to do. Each of you, in your discipline, has got to impart into sometimes able, most times ordinary, but invariably keen minds the basics that will enable them to exercise their professions and their skills competently.

Has the university ever had a feedback from the students? What are you doing now? What do you wish you had studied when you were in university? What subjects you studied were a waste of time? But nobody has ever asked. I am fearful that in too many instances, teachers may be

regurgitating and transmitting what they had learned half a generation ago, whether it is still valid and relevant, or whether it has been overtaken by research and new knowledge. They carry on with the textbooks of their student days.

Of course, these faults are found not only in the university. They are found also in our schools. We are putting them right. We know that the majority of our parents are uneducated, which makes the job difficult. Educated parents can make the speed of learning swifter. What is learnt in school is reinforced at home.

From time to time, I visit ordinary homes, casually without notice. It enables me to interpret the statistics I receive. It gives me that personal experience of people, clothes, furniture, electrical appliances in our one, two, three, four, five-room flats; it brings to life the meaning of the different income brackets and socio-economic groups, for I meet real people and families who live in these homes. What has struck me again and again when visiting. I see hi-fi, marble or terrazo tiles, expensive furniture, colour television. But I have never seen a book-case or a book shelf. I have seldom seen a painting. They have photographs, of fathers and mothers, of grandfathers and grandmothers. One home had books and paintings. He was a returned student, Chinese-educated,

from a Japanese university. He had a Japanese wife. He was a cultured man with a cultured wife.

We have been educating our children on the cheap because that was all we could afford. We doubled school sessions, mass-produced teachers. The results have been less than ideal. Nevertheless, we have got by because our people had innate talent. If we were a slow or lazy lot, we would never have made it.

When I look back, I am amazed that despite the shortcomings of the system, we threw up top professionals, some of world-class. Every year, we send our best 100 students to universities abroad on scholarships. Half would come back with top honours and from some of the most vigorous of universities in the world. Despite a total change in environment, the shock of a different culture, and the problems of adjustment, all have made it. Unfortunately, this easy way of educating our top students meant that our average students got less than the best teaching in our own university. We can put this right.

We shall do much better if we train our students better and not just our top students in top universities. This emphasis on the quality of teaching comes at an appropriate time, when we have passed one phase of our economic

development and are about to climb up the technological ladder to the next phase. Both schools and university must have better teachers. The university must go on to more postgraduate work, for Masters or Doctorates. We now have the money. We can muster the resources. We have the buildings. We can afford the books, journals and audio-visual aids. What is difficult to recruit and assemble are the educators, the stimulators, the guides. It takes time to identify good teachers and to match and organise them into working teams. That is our prime task. For it is the enthusiasm and the professional competence of teachers, plus the leadership of the heads of departments, that make a good university.

I recognise that we cannot find the numbers and the quality of men from Singaporeans. In Table 3, you see that right now, of a total full-time academic staff of 669, only 340 are Singaporeans, around 50%; other Asians, 279; Caucasians 50. Table 2 shows in detail how many more teachers we must recruit in each department. We need to treble the staff. We can never hope to find more than 40% Singaporeans, although I hope Singaporeans will be in charge of most departments. The demand for high quality manpower in government and in the private sector is simply too immense. In government, there are many sensitive jobs which can only be done by Singaporeans. For university teaching, it is irrelevant whether the teacher is a white man, a black man, a yellow man, a brown man, or a mixed man. Is he competent? Is he

enthusiastic? Does he spark interest in his students? The world is our market for teachers. This means we must pay the world market price if we want good teachers. And that is what we propose to do. At the same time we shall encourage more Singaporean scholars be university teachers.

On 13 March 1979, I had my first meeting with the VC on salary revisions. I had mulled over the problem of relatives in pay. If we want some of the best minds, with a practical bent, to be in the Administrative Service, the premier service, what do we pay the university teachers? A top administrator must have a mind as good as any university professor, plus that strong character and steady temperament, under pressure, to be a good decision maker.

Academics must be bright scholars. But bright scholars do not necessarily make top decision makers. I have tried out several academics in ministerial positions.

I have found that there are other qualities needed besides a good mind, indeed, a

whole complete set of characteristics that make that man calm and collected under crisis, and able to give the lead in difficult situations.

Hence, the decision that the top administrator goes on to Staff Grade 1, 2, 3, will be above the university professor grade. It has to be. It is so in all the advanced societies. On the other hand, however, I believe we can give the university teacher a higher salary start than the administrator. An able graduate

should be encouraged to do research and to teach. In mid-career, through consultancy work or participating in projects in a statutory board or a government department, if we find that he can take hard decisions and handle difficult situations, i.e. he can work under stress, he can cross over to be an administrator or a minister.

I have read the deputy VC's notes arguing that a good professor should be paid as much as a permanent secretary. I disagree. If a man is good enough to be a permanent secretary, we are misusing him as a professor. We do not have that many able decision makers. I can always find another professor for the university. I cannot find another permanent secretary from the world market.

I had a second meeting with the VC on 18 May. He did not like the reintroduction of expat pay. I overruled him. A committee of younger ministers had worked on these problems. They were revising the Administrative Service and professional services - doctors, lawyers, engineers and other professionals. Their conclusion confirmed mine, that we must recruit from all over the world. Let me add that our approach to expats working in Singapore has changed. We are looking for good men and will be happy to offer those who like to stay, a life-long career. Our previous policy of short-term contracts tended to attract the rolling stones. Those who want to be Singaporeans, whether they are from India,

Pakistan, Bangladesh, Sri Lanka, Hong Kong, Taiwan, or East Africa, or Britain, can take up permanent residence and citizenship.

The salary scales are as the VC was given and have presented to you. As for NU staff, the NU Establishment Committee will emplace NU staff on the revised SU scales before absorption into the NUS.

However, every two to three years, we shall review the incomes of comparable professionals in the private sector. Most of the data in Inland Revenue Department have been computerised. We have been remiss in the past. We had not adjusted salaries fast enough. There had been discrepancies in pay, resulting in the loss of good officers from the public to the private sector. Despite the revision in 1979, the chances are the private sector will move ahead faster than the public sector with the yearly NWC recommendations. We shall make regular checks to keep abreast.

With a revision every 2-3 years, the gap between Singaporean salaries and expatriate salaries will close because Singaporean salaries will go up rapidly, barring a world recession. Taking our lower income tax policy into account, and given 8% growth, in five years we should be paying more in take home pay than the UK pay their academics.

We shall offer to Singaporean academics attractive career development. It will allow you to fulfil yourselves. There will be more consultancy work. We shall encourage interaction with government and statutory boards, TAS, PUB, HDB, PSA, EDB, JTC, PWD. We will encourage research, preferably research with relevance to the economy or to society. We shall be more generous in grants for conferences overseas.

I have to disappoint those who are non-professionals. The Government has decided to follow the free market in resolving this vexing problem of differentials between the private and public sector. We reinforced this decision when we decided to pay lawyers professional allowances after giving the doctors up to 60% of consultancy fees. For years the consultancy fees of doctors have swung from a percentage of their fees to a fixed lump sum. We have now decided that we shall let market forces settle this question. If you are in a discipline which does not command a high price in the market, it's bad luck.

There are enough problems in the NUS without having a trade union of professors who want to take the administration on. A circular dated 4 December: "If you accept the administration's individual offers, you will prejudice the union's position in collective negotiation. You will be undermining

your fellow academicians. "It continued: "Do not sign away your right to collective negotiations. You may discover too late that you do not benefit immediately or to any meaningful extent from the revised salary scheme. We promise you swift and positive action. We will try our very best to bring the issues to the negotiating table to conclude a satisfactory settlement as soon as possible. Within 24 hours of the reconstitution of the union leadership, we have ironed out the strategies."

There is no place for petty xenophobics and little empire builders in Singapore. They cannot be allowed to stop us from building a good university quickly, with good teachers from overseas, Asians or Caucasians. I am ready to justify this policy publicly.

This is not a government likely to be rendered nervous by bluster.

There were no wage demands. I could have left things alone. I went into the university to find out how I could jack standards up. I found a dearth of talent. I instructed that we should add further salary points, and not offer new salary scales for point to point conversion. I took it through Cabinet. I am not allowing a trade union of academics in the NUS. It is inappropriate, indeed improper. Long hours have been spent by the Registrar and the VC. Dr Tony Tan has been at it for only a few weeks. He has come to the conclusion that the trade unionism

of university teachers is an absolute waste of his time, and I fear also that of the students.

With merger, there will be staff difficulties. The Deans had spelt out the fears of their staff: unfair assignment of teaching duties; humiliation, non-acceptance, and victimization; inadequate command of English; compromising of academic standards; poor access to research facilities, etc. Dr Tony Tan will ensure that there will be fair treatment to everyone.

Another point: the NUS should not start off with its degrees devalued. They must be equal to the best in the Commonwealth. NU graduates who sit for NUS honours degrees must be measured by NUS standards. There must be no hesitancy in the exercise of authority by Heads of Departments. Furthermore, department heads must act as Heads; they must not be inhibited in submitting honest assessments on those who did not measure up. A university teacher will be removed only if he is professionally or intellectually limited, and not because his English is not good enough. If a lecturer is not holding his audience because he has a problem in expressing his thoughts in English, he can take the tutorials and seminars. After regular practice during tutorials, his English should become acceptable within 18-24 months.

Let me restate our objective. We have to improve the quality of teaching, by recruiting more and better qualified teachers so that we have better trained graduates. We have to increase the numbers of graduates. Unwisely, in the past, we have been keeping universities student numbers down. Had we eased up ten years ago, today we could have reduced the 20,000 employment passes by some 2,000 - 3,000 SU graduates. We are not going to lower standards in NUS. The standard of a good university in Britain, like London, should be our yardstick. For teachers in the Social Sciences, let me urge you to seize this chance to make your subject relevant. You have a valuable function: for example, to conduct surveys to find out how the graduate is doing, what he missed as a student, what was he taught that was useless. Help train others to get the feedback and improve their teaching. As our society matures, all departments will come into their own. For our objective is the educated man.

Two to three years ago, Harvard set out to resolve what they called "Core Curriculum.." Harvard tried to define an educated American. He should know a minimum about literature, science, the fine arts, history, music, and so on. We should study their core curriculum. Between junior college and first or second year in university, every undergraduate should have read, been instructed in, and been examined on a basic core of subjects that then entitles him to be considered an educated man.

My test of an educated person is a simple one. Has he been schooled to a point where on his own he continues to probe, to learn, to read, and to solve problems for himself? Has he got an inquiry frame of mind? Does he know where to look for knowledge or data? If he does not know where to get the data, or does not understand books he has found on the subject, does he know who he can approach to help him understand the subject. In short: Is he continuing to learn, or did his learning stop the day he got his degree? My suspicion is that the average Singapore graduate stops reading after he has got his degree. Any further reading is confined to his own specialisation, to advance in his profession. That is not my definition of an educated man because he has too narrow, too constricted, a view of life.

I am not unhopeful that we shall have the educated Singaporean within ten years. Given a different approach in our schools and in the university, we can cultivate a totally different frame of mind.

Meanwhile, between SU and NU, from income tax figures, we have more than 30,000 graduates, of which 19,000 were in the last 10 years. Many of them seek new or higher qualifications. One in great demand is the degree of Master in Business Administration. We are starting such a course. I am certain

other courses must be in demand. And for those who did not make the university because the cut-off points were too high, can the university not offer extramural and extension courses, leading to diplomas and to degrees? The NUS should offer this to our young as a second chance.

Finally, let me announce that Dr Tony Tan will take over as Vice-Chancellor when Mr Kwan Sai Kheong retires in July. His task is to get the NUS going along the lines I have sketched out. He knows my thinking. We have discussed our problems in education over the last 16 months. This task requires him to go in a quest for educators to turn out the educated Singaporean. Singaporeans fortunately are an educable lot, keen to improve, eager for knowledge - first, for utilitarian purposes, and later, I hope, for the joy for knowledge, the satisfaction of comprehension and understanding of the world around him. How long will Dr Tan take to do this job? Until he can find a suitable man to be Vice-Chancellor. And that cannot be soon enough, because I have other equally important responsibilities for him to undertake. He will see through the first phase of the NUS. He has my full confidence. I urge you to give him your full cooperation.

PLANNED UNIVERSITY UNDERGRADUATE INTAKES (1980-90)

Course Year	Total	Arts/* Social Sciences	Science*	Medicine	Dentistry	Law	Engineering**	Architecture	Building/ Estate Mgmt	Accountancy	Business* Admin
Number											
1979 (Actual)	2636	608	567	140	36	97	514	52	72	237	313
1980	3067 (3816)	696	604	160 (213)	38 (49)	114 (192)	651 (844)	98 (98)	85 (107)	285 (354)	336
1981	3484 (4011)	766	694	160 (215)	38 (49)	138 (194)	781 (911)	102 (102)	110 (110)	325 (363)	370
1982	3974 (4106)	843	798	203 (215)	38 (50)	165 (195)	937 (959)	104 (104)	114 (114)	365 (371)	407
1983	4453 (4201)	900	910	203 (223)	38 (50)	201 (195)	1100 (1005)	106 (106)	117 (117)	425 (379)	453
1984	4459 (4299)	900	910	203 (223)	38 (51)	201 (196)	1100 (1052)	108 (108)	121 (121)	425 (387)	453
1985	4486 (4373)	900	910	203 (223)	60 (52)	201 (197)	1100 (1083)	111 (111)	123 (123)	425 (395)	453
1986	4610 (4405)	900	910	203 (179)	60 (52)	220 (198)	1200 (1109)	113 (113)	126 (126)	425 (400)	453
1987	4615 (4481)	900	910	203 (181)	60 (53)	220 (200)	1200 (1135)	115 (115)	129 (129)	425 (405)	453
1988	4619 (4558)	900	910	203 (183)	60 (54)	220 (201)	1200 (1164)	117 (117)	131 (131)	425 (409)	453
1989	4626 (4645)	900	910	203 (188)	60 (55)	220 (202)	1200 (1195)	121 (121)	134 (134)	425 (414)	453
1990	4633 (4741)	900	910	203 (192)	60 (57)	220 (203)	1200 (1237)	125 (125)	137 (137)	425 (419)	453
Planned Increase in Intake as Percentage of Actual 1979 Intake											
1980	16.4	14.5	6.5	14.3	5.6	17.5	26.7	88.5	18.1	20.3	7.3
1985	70.2	48.0	60.5	45.0	66.7	107.2	114.0	113.5	70.8	79.3	44.7
1990	75.8	48.0	60.5	45.0	66.7	126.8	133.5	140.4	90.3	79.3	44.7

Note: Figures in brackets are the intake requirements projected by the Ministry of Trade & Industry (MTI) and approved by the Council on Professional and Technical Education, based on a GDP Growth Rate of 8% pa, and a Productivity Growth Rate of 6% pa. They are used for planning the intakes for the various courses.

* MTI projected the intake requirements for Arts/Social Sciences, Science and Business Administration as a whole; there are no separate projections for each course. The total intakes projected for these courses are included in the "TOTAL"

** The MTI projections indicated are only for the engineering courses taught in Singapore, namely, civil, Electrical, Mechanical and Chemical Engineering.

UNIVERSITY STAFFING TARGETS (1980-85)

(excluding English Language Proficiency Unit and Chinese Language & Research Centre)

Faculty Year	TOTAL	Arts/ Social Sciences	Science	Medicine	Dentistry	Law	Engineering (incl. NTI)	Architecture	Accountancy Business Admin
April 80 (Actual)	Member								
	629	157	115	141	18	20	84	41	53
	711 (987)	156 (187)	122 (176)	161 (180)	23 (23)	20 (37)	115 (170)	47 (57)	67 (157)
	831 (1130)	178 (214)	146 (202)	184 (184)	27 (27)	24 (42)	145 (213)	50 (60)	77 (198)
	986 (1323)	199 (239)	169 (225)	222 (222)	33 (33)	29 (51)	190 (274)	58 (70)	86 (209)
	1115 (1508)	218 (262)	192 (260)	229 (229)	39 (39)	34 (62)	240 (339)	68 (82)	95 (235)
	1244 (1643)	230 (277)	207 (284)	233 (233)	44 (44)	39 (71)	310 (389)	77 (92)	104 (253)
	1295 (1703)	237 (285)	211 (288)	238 (238)	46 (46)	43 (77)	327 (420)	80 (96)	113 (253)
	Planned Increase in Staff Strength as Percentage of April 1980 Staff Strength								
	1980	13.0	-	6.1	14.2	27.8	-	36.9	14.6
1981	32.1	13.4	27.0	30.5	50.0	20.0	72.6	22.0	45.3
1982	56.8	26.8	47.0	57.4	83.3	45.0	126.2	41.5	62.3
1983	77.3	38.9	67.0	62.4	116.7	70.0	185.7	65.9	79.2
1984	97.7	46.5	80.0	65.2	144.4	95.0	269.0	87.8	96.2
1985	106.9	51.0	83.5	68.8	155.6	115.0	289.3	95.1	113.2

Note: The planning figures are believed to be achievable. The figures in brackets are the ideal, but generally unachievable, staff strengths, based on a staff: student ratio of 1:10 for all faculties except Medicine (1:4) and Dentistry (1:6).

FULL-TIME ACADEMIC STAFF MEMBERS

(As at 23 April 80)

	TOTAL	Singaporean	Other Asian	Caucasian
	Number			
TOTAL	671	341	280	50
Arts/Social Sciences	157	88	54	15
Science	115	69	44	2
Medicine	141	81	52	8
Dentistry	18	11	7	-
Law	20	11	6	3
Engineering	84	32	50	2
Architecture	41	13	20	8
Accountancy/Business Admin	53	25	25	3
ELPU	33	9	15	9
CLRC	9	2	7	-
	Percentage in each Faculty			
TOTAL	100.0	50.8	41.7	7.5
Arts/Social Sciences	100.0	56.1	34.4	9.6
Science	100.0	60.0	38.3	1.7
Medicine	100.7	57.4	36.9	5.7
Dentistry	100.0	61.1	38.9	-
Law	100.0	55.0	30.0	15.0
Engineering	100.0	38.1	59.5	2.4
Architecture	100.0	31.7	48.8	19.5
Accountancy/Business Admin	100.0	47.2	47.2	5.7
ELPU	100.0	27.3	45.5	27.3
CLRC	100.0	22.2	77.8	-

Notes:

ELPU = English Language Proficiency Unit

CLRC = Chinese Language Research Centre

Table 4FULL-TIME ACADEMIC STAFF IN DEPARTMENTS AFFECTED BY MERGER

(As at 23 April 80)

Department	Total	SU	NU
	Number		
<u>ARTS & SOCIAL SCIENCES/ARTS</u> TOTAL	120	80	40
Chinese Studies/Chinese Language & Literature	16	7	9
Economics & Statistics	34	26	8
Geography	19	12	7
History	16	10	6
Political Science/Government & Public Administration	16	10	6
Sociology/Sociology & Psychology	19	15	4
<u>SCIENCE</u> TOTAL	101	65	36
Botany & Zoology/Biology	22	16	6
Chemistry	25	15	10
Mathematics	31	19	12
Physics	23	15	8
<u>ACCOUNTANCY & BUSINESS</u> <u>ADMINISTRATION/COMMERCE</u> TOTAL	53	33	20
Accountancy	24	17	7
Business Administration/Industrial & Business Management	29	16	13
<u>ENGLISH LANGUAGE</u> English Language Proficiency Unit/ Language Centre	33	16	17
Total affected by merger	307	194	113
Total not affected by merger	364	346	18
Grand Total	671	540	131
	Percentage		
Total affected by merger	45.8	28.9	16.8
Total not affected by merger	54.2	51.6	2.7
Grand Total	100.0	80.5	19.5

STUDENT-STAFF RATIOS IN SELECTED BRITISH UNIVERSITIES

- Rates:
1. Student-staff ratio is the total number of full-time graduates divided by the total number of full-time teaching and research staff paid directly from university funds.
 2. Figures for UK universities are for 1974-75. Figures for NUS are the combined SU/NU position for 1979-80.
 3. Only faculties with more than 100 students are included in this table.

University	Arts & Social Sciences	Science	Engineering	Architecture & Town Planning	Business & Management Studies
NUS	13.0	13.6	18.1	12.5	29.0
TOTAL UK	8.2	5.0	6.0	7.4	4.8
Birmingham	7.5	4.0	3.8	-	-
CAMBRIDGE	10.6	2.8	7.2	12.1	-
Durham	9.8	6.4	8.4	-	-
Edinburgh	9.6	4.9	4.5	8.5	3.2
Glasgow	8.9	5.8	5.6	-	-
Leeds	8.2	5.6	6.9	-	4.5
Liverpool	9.7	5.8	5.4	6.1	-
LONDON	5.3	4.2	4.6	3.9	-
Manchester University	7.8	5.0	6.1	6.5	-
Manchester Institute of Science & Technology	3.2	3.8	3.6	-	10.9
Newcastle	9.8	4.2	6.6	7.4	-
Nottingham	9.2	6.0	7.8	7.4	-
OXFORD	8.0	5.3	5.9	-	-
Sheffield	8.6	6.8	6.5	6.1	8.8
Southampton	9.2	4.5	5.4	-	-
Strathclyde	9.8	8.3	5.6	6.7	3.4