

# Students' feedback – what can we do with it?

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## CONTEXT

Tertiary education is a highly competitive sector in Australia that is changing continuously. Growing student numbers and developing our programs to promote meaningful learning by our students are very important. The School of Engineering and Technology (SET) at Central Queensland University (CQU) set an objective in 2015 to actively promote innovation in learning and teaching practices with the aims of increasing student retention, reducing attrition and improving the academic outcomes of our students. By proper consideration of students' feedback and taking quick and appropriate action to ensure we are closing the loops, it is possible to achieve the School's goals through innovative teaching practices. Through addressing students' feedback and applying innovative teaching and learning practices to improve the student experience, school performance has achieved positive results in recent years. Student attrition has seen a fall from 25.3% in 2010 to 21.7% in 2014.

## PURPOSE

The purpose of this study is to review the importance of responding to feedback from students attending my courses on their learning outcomes and their satisfaction with various elements of my courses: one traditional course titled Solid Mechanics and Computational Analysis (ENEM14012) and a learner centred course titled Fluid and Electrical Drive Systems (ENEM13011).

## APPROACH

CQU utilises online evaluations for each course in each term of the year through a Student Experience Survey (SES). Student feedback relating to my courses is collated from those surveys. With careful consideration and evaluation of these data using a new students' feedback evaluation framework developed by the author, a few recommendations are proposed through an Annual Course Enhancement Report (ACER) to the program committee of the school with a view to implementation in the next offerings. The effectiveness of this is tested by collecting the same data through the next SES. Through ongoing comparisons of the student satisfaction data, the method of closing the loop of student feedback data is evaluated.

## RESULTS

The SES data for my courses showed that student satisfaction was increasing gradually for best managed courses. So the proactive implementation of appropriate responses to student feedback on their learning journey is effective in improving both student perceptions of their courses and their course outcomes.

## CONCLUSIONS

Actively listening to student feedback and quickly taking appropriate action is one of the most effective teaching practices that we can use to enhance the great learning journey of students in our school at CQU. By doing so, student satisfaction and retention rates can be increased and the attrition rate can be reduced.

## KEYWORDS

Student feedback, satisfaction, attrition, retention.

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## Introduction

It is the utmost task of the tertiary educational sector to develop programs to promote meaningful student learning. Both traditional and online student feedback systems are popular. With advancement of internet-based technology, measures of effectiveness of the teaching and learning process involving student ratings have become most important for administrative review and assessment for quality assurance. University students complete a formative review of their courses at appropriate intervals. In most cases, this study happens at the end of every semester (Eng et al. 2015). Student feedback has a great influence not only on quality assurance of course delivery, but also on development of individual lecturer's good practices towards improving the student's quality of learning. Otani et al. (2012) correctly articulated that students' feedback had a significant impact on transformation and modification, improvement in lecture materials and course delivery, course requirements and assessment methods and classroom management, engagement and interaction. There are some benefits (Kuhman, 2004) of online course evaluations focusing on time and costs and quick reporting of results. In this system, students can provide their feedback at any time during the feedback period. This section elaborates upon student feedback systems of various forms and how CQU is managing targeting of student feedback.

### Traditional evaluation

In the early 1920s, University of Wisconsin (Eng et al. 2015) first implemented student evaluation by collecting feedback from students so that faculty members would be more aware of students' needs. In a traditional system of evaluation, a set questionnaire along with a rating scheme in printed form is distributed to students at the end of a semester to seek out their comments. Course lecturers are not generally involved in the feedback system. Other lecturers can manage the process. Analysis software or Microsoft Excel can be used to process student feedback data. This has been found to be very effective in the past as a guide (McKeachie, 1997; Pike, 1998) for instructors to identify their strengths and weaknesses in teaching courses and find ways to improve student learning quality by addressing identified shortfalls of teaching skills. Recently, Pereira et al. (2016) focused on students' perception on effectiveness and relevance of feedback on assessment methods and self-regulation of learning. Through a set of open-ended and closed questions, the feedback results showed that more relevant, effective and positive feedback was given by students whose course outcomes were assessed by learner-centred methods compared to those assessed under traditional methods.

### Online evaluation

In many places, this process is controlled by internal student evaluation through a web-based student feedback system (Gaertner, 2014). An online system is generally used to evaluate course materials and teaching and learning components in terms of the lecturer's quality assurance, performance, course content infrastructure and information technology tools (Eng et al. 2015). At CQU, a learning management system (LMS), called Moodle, is used for this purpose. The concept of self-evaluation of course performance is for quality assurance purposes and ongoing development of the students' learning journey. Students' perspectives in the evaluation of courses and teaching are still viewed with scepticism even though the reliability and validity of students' perceptions of teaching are regularly confirmed. Solicited students' feedback data managed by the university LMS can be a basis of self-reported changes in teaching practices to further enhance performance matrixes of courses. The course performance matrix (CPM), discussed later, is populated through the responses/feedback given by students. Various colour codes are used to highlight different levels of course performance. By closing the loop of student feedback, continuous improvement to produce better student learning outcomes is achievable. In this setting it is most important to understand how a new approach evolved because of the feedback, how it works in practice and how we know that it has contributed in some measurable way to better

engagement that is demonstrated by improved learning outcomes. Gaertner (2014) pointed out that the quality development of courses requires continuous cycles of: (1) setting objectives, (2) planning activities, (3) evaluation and (4) derivation of new measures. This self-evaluation process is very much in line with what is in place at CQU. Schildkamp and Visschers (2010) defined self-evaluation as a systematic information gathering process initiated by a university for supporting decision making, organisational learning, and fostering university/school improvement. Among many proposed in the literature, Gaertner (2014) considers that the ideal steps for processing feedback information are:

- perception – lecturers must observe and understand student feedback
- interpretation – lecturers can identify the explanations for the results
- action – specific approaches and measures are implemented to optimise teaching outcomes
- re-evaluation – post-implementation evaluation of the measures is undertaken and a new evaluation cycle evolves.

The above model includes individual, university/school and context characteristics and is presented schematically in Figure 1.

### **Traditional vs online evaluation methods**

Both the traditional and online evaluation methods work effectively for the purpose of course and teaching evaluations as a decision making tool to promote professional and career advancement, promotion and tenure. Table 1 illustrates a simple comparison of the effectiveness considering different aspects of student rating calculations.

The literature search discussed above has illustrated that there were many studies conducted to work on students' feedback to improve course content and delivery, develop new good teaching practices and finally enhance students' effective learning experiences. Still there are many studies that can be conducted to employ a general model to treat feedback and close the loop. In this study, a new self-regulatory assessment of students' feedback model is considered to change teaching practices so as to develop a good student learning environment. As a result, when proactively closing the loop of feedback, it can be seen that students' evaluations on feedback rate and satisfaction on courses can be improved over CQU corporate targets and thereby students' retention data can be improved. The next section presents how CQU manages students' feedback data through CPM.

## **Course Performance Matrix at SET, CQU**

Students of SET at CQU provide SES feedback on their courses through Moodle. The students are giving constructive, effective and relevant feedback on various things regarding the courses they are enrolled in within a set period towards the end of each semester. Students provide this feedback in their own time and anonymously. The feedback areas are Moodle Navigation, Learning Resources, Assessment Task, Assessment Requirements, Assessment Return and Assessment Feedback. The students provide a rating from 1 to 5 in each area and a course performance matrix processes these ratings to provide overall student satisfaction rankings of courses through colour coding. CQU's rating system is defined as 1 for strongly disagree, 2 for disagree, 3 for neither agree nor disagree, 4 for agree and 5 for strongly agree. CQU sends the following request out to the students:

*"We invite you to use this anonymous survey to tell us what you think of this course. We will use the information you provide to help us enhance the overall course design, delivery and outcomes as part of the course enhancement process (aggregated data may also be used for academic research purposes). We expect that our courses will provide you with a positive learning experience and enable you to reach your potential, meeting the following outcomes:*

- *providing you with opportunities to develop the appropriate knowledge, skills and attitudes.*
- *communicating clear expectations, in terms of what you need to do in order to succeed in the course.*

- using an active and collaborative approach, to engage and challenge you to succeed.
- using assessments that allow you to demonstrate the extent of your learning”.

CQU’s Moodle system analyses the feedback data including students’ response rates, and the aggregated data are populated in colour coded categories as shown in Table 2.

## Method

Students’ feedback data obtained through SES is statistically viable at SET, CQU if there are more than 10 students in a course and 50% or more students provide feedback. The author considered two courses, one utilising a learner centred method and another on a traditional method, whose student numbers are more than 10. A traditional course titled Solid Mechanics and Computational Analysis (ENEM14012) and a learner centred course titled Fluid and Electrical Drive Systems (ENEM13011) are considered in this study to focus on their students’ feedback and corresponding teaching intervention performed through a new student feedback assessment method developed by the author modifying the model of Gaertner (2014). The steps of this new method are set out in Table 3.

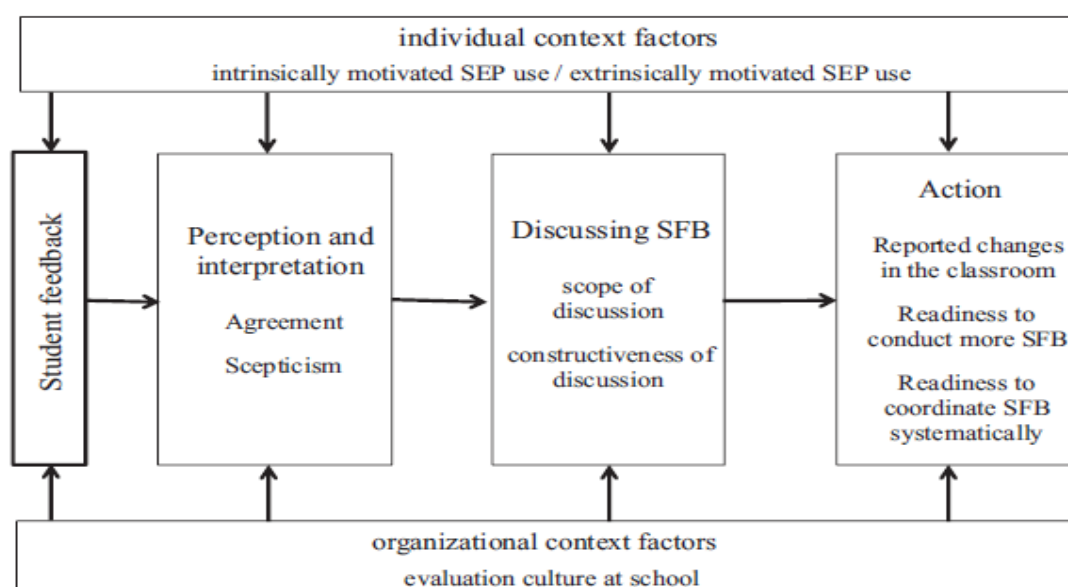


Figure 1: Model for reflective practices (Gaertner, 2014)

Table 1: Evaluation of traditional vs online methods

| Items  | Traditional (paper-based) Method  | Online Method   |
|--|---|---|
| Time and costs   | More  | Less  |
| Feedback time  | Within a set time, maybe under the influence of lecturers               | Anytime and without the influence of lecturers  |
| Students’ likeliness (preferred by students) (Layne et al. 1999) | Less  | More  |
| Processing time  | Not so quick  | Quick   |
| Easy use (Ravelli, 2000)   | No anonymity of students, therefore feedback quality may be in question | Anonymity of students, therefore feedback quality may not be in question and more thoughtful feedback can be obtained |
| Computer and internet onnection                                  | Not needed  | Yes   |
| Students’ response rate (Dommeyer et al. 2002)                   | High  | Low   |

**Table 2: CQU corporate targets on students' satisfaction and response rate**

| Items                          | Green         | Yellow              | Red           |
|--------------------------------|---------------|---------------------|---------------|
| Students' overall satisfaction | 4.0 and above | Between 3.0 and 3.9 | Less than 3.0 |
| Students' response rate        | 50% and above | Between 30% and 49% | Less than 30% |

SET, CQU administers this process through discipline leaders in each discipline: Civil, Electrical and Mechanical Engineering. The course coordinator of each course prepares an ACER using some strategies (Table 3, for example) to propose various measures based on the students' feedback. This process is assisted by the CQU NEXUS system that is designed to support a range of academic processes related to course and program accreditation, operation and reporting. Some of the tasks undertaken by NEXUS are production of course profiles, examination papers, ACERs etc. The ACERs administered by each discipline leader are placed before the program committee for further broader scale discussion. The final recommendations for good teaching practices due to students' feedback approved by the program committee are populated to the course profile (CP) of this course offering in the next term. Students and course coordinator and lecturers can all see the feedback and corresponding recommendations in the CP. The CP is then considered as a quality assurance document to carry out appropriate measures for a better student learning journey.

**Table 3: Steps of processing students' feedback**

| Steps                             | Actions  |
|-----------------------------------|--|
| Acquire students' feedback data   | Course coordinator accesses the feedback data from the Moodle site and populates it into an Excel file.  |
| Perception of feedback data       | Course coordinator/lecturers must observe and understand student feedback.   |
| Interpretation of feedback data   | Course coordinator/lecturers identify explanations for the data.   |
| Classification of feedback data   | Course coordinator/lecturers classify the data into various areas such as course content, Moodle site navigation, teaching resources, assessment task, assessment return with quality lecturer feedback etc. |
| Action taken due to feedback data | Course coordinator/lecturers develop and implement specific approaches/measures to optimise teaching performance via ACER.   |
| Re-evaluation in next term        | Course coordinator/lecturers undertake post-implementation evaluation of the selected measures to assess their impact during the new feedback cycle for further modifications.                               |

## Results

Students' actual feedback on ENEM13011 and ENEM14012 is now presented through classifications, ranking and summarising following the Moodle/CPM method detailed previously. The students' feedback considered here covers from 2012 to 2016. Associated teaching interventions are also proposed for both courses.

Because of the multi-campus teaching mode at CQU, a team teaching method is adopted for the CQU Rockhampton, Mackay, Gladstone and Bundaberg campuses where both ENEM13011 and ENEM14012 are offered. Different lecturers conduct tutorial sessions, laboratory classes and workshops at different campuses. Students like to see similar learning experiences provided at all campuses and a high degree of uniformity is therefore necessary. As such, delivery should be mostly the same in all significant respects: lectures, tutorial sessions, test rigs, laboratory sheets etc. As a course coordinator, the author tries to maintain standard approaches to assessment tasks, similar processes for responding to student queries and uniformity in marking processes. As this situation is complex, any difference in approach in innovative teaching practices can result in dissatisfaction among student cohorts that will almost certainly be reflected in their feedback. As these issues are not general in nature over different years, they are not populated in the process in Table 3.

## Students' feedback and teaching intervention of the course ENEM14012

This course is examination based and there are three assignments with weightings of 20% each, a workbook with a pass/fail criterion and a final examination with 40% marks. Typical feedback from a student in 2014 focusing on various questions set by CQU through its Moodle site can be seen in Table 4. The last two cells of the first column of Table 4 introduce open ended questions for students to highlight positive and negative aspects of the course with a response by a single student. The course coordinator can see good delivery areas and areas with issues. Table 5 presents specific feedback and related teaching practices introduced because of the constructive feedback obtained through the SESs.

**Table 4: A sample of feedback on ENEM14012 (a student's feedback, 2014)**

| Moodle site questions/statement to students  | Student Feedback (as it is)   |
|--|---|
| Overall, I was satisfied with the quality of this course.  | Strongly agree  |
| The Moodle site for this course was easy to navigate   | Strongly agree  |
| The resources provided in this course supported my learning  | Strongly agree  |
| The assessment tasks in this course helped me to learn   | Strongly agree  |
| The requirements for each assessment task were clearly explained   | Strongly agree  |
| My assessment work was returned in a timeframe that supported my learning  | Agree   |
| The feedback given on my assessment work helped me to learn  | Neither agree nor disagree  |
| What are the best aspects of your course? If you wish, you can expand and explain your answers above.                    | The structure is very good  |
| What aspects of your course are most in need of improvement? If you wish, you can expand and explain your answers above. | Assignment 3 results prior to commencing exam. Solutions for assignments prior to doing exam would be beneficial. |

**Table 5: Positive and negative feedback and teaching practice intervention**

| Classifications       | Students' Comments   | Intervention  |
|-----------------------|--|---|
| Moodle site           | Availability of most information and the management of the Moodle site were well executed. Feedback and correspondence initiated by the lecturer was consistent (feedback 2013, 2014).   | Following the same strategy in the future                                     |
| Course content        | I also found the content is highly relevant to almost all mechanical engineering tasks. Will be using the skills and knowledge I developed from this course every day in my work placement (feedback 2013, 2014, 2015).  | Following the same strategy in the future and updating the content every year |
| Tutorial sessions     | Tutorials were excellent and interactive. Really helped to be taken through each step of each question. Using objects in lectures helped understanding of complex concepts. Expectations for assignments were clearly stated and helped learning significantly. (feedback 2014). | Following the same strategy in the future                                     |
| Regular communication | Lecturer made regular updates and contact with students. A well run course (feedback 2014).  | Following the same strategy in the future                                     |

|                                  |   |   |
|----------------------------------|---|---|
| Lecturer                         | Nirmal puts a lot of effort and commitment into ensuring he always has positive contact with the class. It is obvious that Nirmal strives to ensure that each student is on task and up to date (feedback, 2013, 2014, 2015).   | Following the same good teaching strategy in the future   |
| Lecture and tute recordings      | No recording of lectures made revisions difficult; also would have been a severe disadvantage to flex students (feedback 2012).   | Recording facilities were not managed in 2012. Adequate arrangements were then introduced and no issues on recording evolved later.   |
| FEA software and Citrix problems | No in depth teaching of Strand 7 FEA software. Strand 7 is a great program and should be taught more of as it is a very helpful tool. 1 week is not enough (feedback 2014). Citrix has always given students grief and this time was not the exception. I thought we had moved to AnyDesk. Even though it's slow, AnyDesk has not become such an issue as Citrix is (feedback, 2015). | Initial teaching practice on this FEA code was through a step by step procedure handout to solve a truss problem by Strand 7. From 2016, a recording of each step in pre-processing and post-processing using Strand 7 is programmed. Through ACER, Citrix problem connecting Strand 7 from home computers was discussed; AnyDesk will be used from 2016. |
| Examination length               | Exam was complex for 2hr time (feedback, 2014, 2015)  | This type of feedback came in 2014 and 2015. The author initiated extending examination time to three hours from 2016.  |

### Students' feedback and teaching intervention of the course ENEM13011

This is a project based learning (PBL) course and utilises a compulsory teaching portfolio submitted by the students through Moodle at the end of this course to allocate students' grades based on their claims and solid supporting evidence of those claims. The evidence and examples are provided by the students from various works: individual – reflective journals, demonstrated problem solutions; and workbook and team work – two project reports and two laboratory reports (one in electrical drive systems and another in fluid drive systems). The students' feedback was obtained through the course Moodle site from 2012 to 2016. Table 6 presents specific feedback and related teaching practices introduced because of the comprehensive feedback obtained through SES.

**Table 6: Positive and negative feedback and teaching practice intervention**

| Classifications | Students' comments  | Intervention   |
|-----------------|---|--|
| Moodle site     | The best aspect of this course was the Moodle site as it was easy to navigate and find weekly resources (feedback 2012, 2014). In 2016, multiple files and disorganisation of the Moodle site were pointed out.   | An easy to navigate Moodle site is the top priority of good teaching practices. Further improvement is targeted.   |
| Course content  | Good to learn some practical aspects of electrical engineering and further knowledge in hydraulics and fluid drive systems (feedback 2012). The course content was available early and lectures uploaded in a timely manner. The structure of the course was clear and students given flexibility to learn (feedback 2012). The electrical knowledge in particular was challenging (feedback 2012), literally thrown in the deep end as the content was far too difficult for our level of understanding of electrical components (feedback, 2014, 2015, 2016). | Teaching team's view echoes with students' feedback on electrical content of the course. Through ACER and a discussion in the Mechanical Engineering discipline and program committee of the school, this course ENEM13011 is terminated in 2016. A new course called Fluid Machinery will take its place. |

|                              |  |   |
|------------------------------|--|---|
| Tutorial sessions            | The mechanical Part of term was well run, with more of a focus on Project management. Feedback for the mechanical part of term was quite helpful. Mechanical Tutorials were excellently run (feedback, 2014).                                    | Tutorial sessions are interactive and support student's learning. The same practice will be continued.  |
| Regular communication        | Communication during term from coordinators was good, generally both components (electrical and fluid) were well run (feedback 2013, 2014, 2015).  | This is one of the best aspects of good practices in teaching. It will be improved further in 2017.   |
| Feedback by the facilitators | Feedback on reflective journals, projects and lab reports is required earlier in the semester is required (feedback 2012, 2013).   | Fruitful and timely feedback will be enhanced further in 2017.  |
| PBL modes                    | Project based learning is an effective way to cover and learn the required content. Team based projects are a good learning tool for working outside university (feedback 2012).   | The same standard methods of running PBL courses are being considered in the future.  |
| Assessment tasks             | Assessment task that actually relate to the learning outcomes are needed (feedback 2012, 2013). Both electrical and fluid projects (industry based) are very interesting (feedback, 2014).   | New projects were introduced that were related to the LOs of this course in 2014.   |
| Laboratory studies           | Laboratory component was enjoyable and useful to enhance understanding (feedback, 2013). The lab experiments were very beneficial, and well run (feedback, 2014).  | This is the best part of students' learning and students like it. Therefore, further improvement of laboratory sheets, safety in work place will be enhanced. |
| Learning outcomes (LOs)      | Projects that help meet the learning outcomes. Some of the learning outcomes didn't really relate to course work (feedback 2012).  | The LOs were redefined in 2014.   |
| Assessment criteria sheet    | The criteria sheet is not a standard one. There is no clear difference from one level to another, very hard to claim a level of achievement (feedback, 2013, 2016).  | A new assessment criteria sheet is under consideration and can be used in a new course in 2017. Course ENEM13011 has been removed from the programs.          |
| Text book                    | The text book recommended for the second half seemed to be of very limited use (feedback, 2013). The fluids lab was the most enjoyable labs far within the degree as it was hands on. The text books prescribed were very good (feedback, 2014). | A new textbook on fluid drive systems was introduced in 2014. The feedback in 2014 was positive   |

## Discussions

The last column of Tables 5 & 6 contains information on teaching interventions adopted because of student feedback on the author's courses. They also include comments on the effect/impact of adopted teaching practices through student feedback in subsequent terms. If students can see that their feedback is well respected through changes in CPs and course Moodle sites and appropriate good teaching practices are in place, students' satisfaction data can be improved. For example, the lack of recording of lectures (Table 5 feedback in 2012) did not appear again and were replaced by positive comments on how recordings helped by students being able to listen at a suitable time. This is a clear example of the impact and evidence of good teaching practices to enhance students' learning.

In the context of multi-campus delivery at CQU, the concept of teaching teams is in place and applies to the ENEM13011 and ENEM14012 courses. The course coordinator and the facilitators of a teaching team's course delivery should ensure realistic expectations from the students and consistency in course advice from the team members. Otherwise problems are created (feedback, 2014) and students' satisfaction results fall. It is better to assess and address students' expectations from the course at the start of the course. It is very interesting



to note from Table 6 that addressing students' constructive feedback on projects and course textbook in 2013 resulted in positive feedback from other students in 2014 on these points.

By analysing student feedback, it is clear that students like to see a good course with industry linked projects, productive facilitator's timely feedback on assessment items, good learning resources and regular communication with the students. These are the core aspects of good teaching practices such as the 4-point strategy that the author of this paper presented in a teaching and learning conference in 2015 (Mandal, 2015). Additional aspects are also essential such as proper/standard documentation on format and grading of course assessment tasks through an assessment criteria sheet, reflective journal template, workbook template etc. Another aspect of good multi-campus teaching delivery is team coordination to ensure that common expectations are being presented to students.

By following the learning and teaching good practice methods (Table 3) and by studying student feedback and introducing appropriate teaching interventions, students' satisfaction and attrition rate can be improved.

## Conclusions

A new student feedback evaluation framework is proposed and evaluated considering ENEM14012, an examination based course, and ENEM13011, a student-centred course. Based on an analysis of student feedback data and related interventions in various years from 2012 and new feedback in the following years, the following conclusions can be made:

- Regular communication with students is important
- Facilitators/lecturers fruitful feedback on assignments/projects/lab reports etc. should be on time
- In PBL courses, project scopes should be clear and industry linked
- Caring attitudes towards students are also very important
- Proper coordination of team teaching delivery of courses is essential.

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