

**Irish Science Teachers' Association  
Eol Oidí na hÉireann**



*Listening to the Voice of Science Teachers*

**The Response from Science Teachers in the light of their experience of teaching the new Junior Cycle Science curriculum.**

**Report of Preliminary Findings from ISTA Junior Cycle Science Committee presented at the ISTA Annual Conference**

2019

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**Uploaded to ISTA website on 30/5/'19**

## Executive Summary

This report presents the preliminary findings of the analysis of a questionnaire issued to science teachers throughout the Republic of Ireland during the period February - March 2019. A total of 762 teachers responded to the questionnaire.

The purpose of the questionnaire was to enable science teachers to give feedback on their experience of teaching the Junior Cycle science specification (syllabus) which was introduced in September 2016 and examined for the first time in June 2019. A copy of the questionnaire may be found in the Appendix of this report.

Please note that in this report the term *specification* and *syllabus* are used interchangeably. In the responses of the teachers there are 147 occurrences of the word *syllabus* and 184 occurrences of the word *specification*.

This Executive Summary is structured according to the numbering of the questions in the questionnaire.

**1. Number of years teaching:** 41% of teachers have been teaching between 0- 10 years, 32% of teachers have been teaching between 11 - 20 years ; 18% of teachers have been teaching between 21 - 30 years; 9% of teachers have been teaching between 31 - 40 years.

**2. Level at which teachers are teaching:** 99.6% of teachers teach at secondary school level; 0.4 % teach at third level; 0.1% teach at primary level.

**3. Category of schools in which respondents teach:** 52% of teachers teach in voluntary secondary schools; 27% teach in ETB schools; 19% teach in Community / Comprehensive schools.

**4(a) Time allocation per week for teaching science to first year pupils:** 50% of schools had 120 minutes allocated; 37% of schools had 160 minutes allocated; the remaining 13% of schools had time allocations ranging from 60 minutes to 200 minutes.

**4(b) Time allocation per week for teaching science to second year pupils:** 59% of schools had 160 minutes allocated; 32% of schools had 120 minutes allocated; the remaining 9% of schools had time allocations ranging from 80 minutes to 200 minutes.

**4(c) Time allocation per week for teaching science to third year pupils:** : 64% of schools had 160 minutes allocated; 23% of schools had 120 minutes allocated; the remaining 13% of schools had time allocations ranging from 60 minutes to 200 minutes.

**5. Involvement with the JCT (Junior Cycle for Teachers Support Service) in the provision of CPD (Continuing Professional Development) courses to practising teachers:** 86% of teachers reported that they were not involved and 14% reported that they were involved.

## **6. The role of Classroom-Based Assessments (CBA) in the Junior Cycle science course**

In this section teachers were asked to indicate if they felt that the two Classroom-Based Assessments (Extended Experimental Investigation, CBA1 and Science in Society Investigations, CBA2) have a valuable place in the Junior Cycle science course. 61% of teachers answered yes and 39% of teachers answered no.

A number of themes arose from the responses of teachers:

- CBAs give students a chance to pursue an issue in which they are interested
- Mark associated with CBA should count toward Junior Cycle grade
- Development of new skills
- Students place no value on CBAs
- The Extended Experimental Investigation (EEI) is worthwhile but there is little value in the Science and Society Investigation (SSI)
- Extra workload and lack of facilities are some of the issues relating to CBAs
- The EEI should be done in third year with SSI in second year

## **7. Time availability for teaching the Classroom Based Assessment activities**

In this section teachers were asked to indicate if they had adequate time to teach the Extended Experimental Investigations and Science in Society Investigations in the spirit in which they are intended. 42% of teachers answered yes and 58% of teachers answered no.

A number of themes arose from the responses of teachers:

- Specification (syllabus) too broad, not enough time to devote to EEI and SSI
- Teaching time allocation must be adequate
- Difficulty with lab access and computer access
- Students missing time due to other activities
- Increased stress levels for students and teachers
- Recognition of the importance of the CBA
- Sufficient time reported for completion
- Weaker students will suffer

## **8. Level of satisfaction with assessment criteria / Features of Quality for Classroom-Based Assessment activities**

In this section teachers were asked to indicate their level of satisfaction with the assessment criteria / features of quality that are used in the assessment of the Classroom-Based Assessments 1 and 2.

2% of teachers described their level of satisfaction as very high; 17% of teachers described their level of satisfaction as high; 44% of teachers described their level of satisfaction as average; 22% of teachers described their level of satisfaction as low; 15% of teachers described their level of satisfaction as very low.

The following themes emerged from the analysis of the responses of teachers.

- Vague features of quality
- Lack of objectivity in assessing students' work
- Use of Features of Quality in assessment
- Lack of standardisation in assessment

- Features of Quality are unfair to students
- Inaccessibility of the language used in the Features of Quality
- Frustration voiced by teachers
- Impact on student wellbeing
- Frustration at lack of training or guidance

### **9. The extent to which students will be prepared for the study of Leaving Certificate science subjects**

In this section teachers were asked to indicate on a five-point scale their opinion on the extent to which they feel that students will be prepared for the study of Leaving Certificate science subjects by the Junior Cycle science syllabus.

1% of teachers stated that students would be very highly prepared; 3% of teachers stated that students would be highly prepared; 30% of teachers stated that students would be adequately prepared; 38% of teachers stated that students would be poorly prepared; 28% of teachers stated that students would be very poorly prepared.

The following themes emerged from the analysis of the responses of teachers.

- Lack of depth of knowledge
- "Dumbing down" of science
- Widening of the gap between Junior Cycle and Leaving Certificate
- Concerns re physics
- Adequately, highly or very highly prepared comments

### **10. Level of satisfaction with the SEC Sample Examination paper for Junior Cycle Science**

In this section teachers were asked to indicate their level of satisfaction with the SEC sample examination paper for Junior Cycle science.

2% of teachers described their level of satisfaction as very high; 15% of teachers described their level of satisfaction as high; 53% of teachers described their level of satisfaction as average; 19% of teachers described their level of satisfaction as low; 11% of teachers described their level of satisfaction as very low.

The following themes arose from an analysis of the comments received.

- Common level paper and standard of science
- Requirement for marking scheme to accompany sample examination paper
- Difficult to know the necessary depth of treatment to prepare students for the exam.
- Only one sample exam paper and distributed too late
- Reading age and wordiness of the paper

### **11. Category of students for whom needs are being met by SEC examination paper**

In this section teachers were asked to indicate on a five-point scale their opinion on the category / categories of students for whom they feel their needs are best met by the SEC examination paper.

20% of teachers indicated that the paper met the needs of the above average student; 46% of teachers indicated that the paper met the needs of the average student; 9% of teachers indicated that the paper met the needs of the below average student. The remaining percentage was distributed among combinations of various categories as some teachers chose more than one option.

### **12. Number of Continuing Professional Development (CPD) sessions of science-specific JCT courses attended**

In this section teachers were asked to indicate the number of continuing professional development (CPD) sessions of science-specific Junior Cycle for Teachers Support Service (JCT) courses attended.

19% of teachers reported that they had attended four or more CPD sessions; 22% of teachers reported that they had attended three CPD sessions; 44% of teachers reported that they had attended two CPD sessions; 13% of teachers reported that they had attended one CPD sessions; 2% of teachers reported that they had attended no CPD sessions.

### **13. Level of satisfaction with science-specific JCT courses attended**

In this section teachers were asked to indicate on a five-point scale their level of satisfaction with the science-specific Junior Cycle for Teachers Support Service (JCT) courses which they attended.

[This text has been removed pending response from JCT]

### **14. Number of CPD sessions of whole-school JCT courses attended**

In this section teachers were asked to indicate the number of continuing professional development (CPD) sessions of whole-school Junior Cycle for Teachers Support Service (JCT) courses attended.

10% of teachers reported that they had attended four or more CPD sessions; 19% of teachers reported that they had attended three CPD sessions; 51% of teachers reported that they had attended two CPD sessions; 18% of teachers reported that they had attended one CPD sessions; 2% of teachers reported that they had attended no CPD sessions.

### **15. Level of satisfaction with whole-school JCT courses attended**

In this section teachers were asked to indicate on a five-point scale their level of satisfaction with the whole-school Junior Cycle for Teachers Support Service (JCT) courses which they attended.

[This text has been removed pending response from JCT]

### **16. Application of Junior Cycle template of specification (syllabus) design to Leaving Certificate science subjects**

In this section teachers were asked to indicate their level of satisfaction (very satisfied, satisfied, dissatisfied, unacceptable) if the specifications (syllabi) at Leaving Certificate sciences were to be presented using the same template as that used at Junior Cycle science level.

4% of teachers stated that they would be very satisfied; 11% of teachers stated that they would be satisfied; 33% of teachers stated that they would be dissatisfied; 52% of teachers stated that it would be unacceptable;

The following themes emerged from an analysis of the comments made by teachers.

- Lack of depth of treatment
- Template unsuitable for high stakes examination
- Concern for student and teacher wellbeing due to stress
- Satisfied and very satisfied comments

### **17. Membership of ISTA**

In this section teachers were asked to indicate whether or not they were members of the ISTA. If they were members, they were asked to indicate the number of years for which they have been members and how the ISTA could further cater for their needs.

A total of 85% of the teachers stated that they were members of ISTA. Of those who were members, 42% have been members for 0 - 5 years; 24% have been members for



6 - 10 years; 15% have been members for 10 - 15 years; 7% have been members for 16 - 20 years; 12% have been members for over 20 years.

In response to the question as how the ISTA could further cater for their needs, the following themes emerged:

- Provision of CPD
- Assistance with unpacking Learning Outcomes
- Lobbying (NCCA, DES, JCT)
- ISTA local meetings
- Earth and Space and related CPD
- Support at Leaving Certificate level
- Sharing resources

### **18. Additional comments**

The final sweeper question invited teachers to make any additional comments. These comments were categorised under the following themes:

- Stress of unpacking Learning Outcomes
- Lack of clarity (and more ‘unpacking’)
- Concerns about preparing students for Leaving Certificate
- CBAs and Assessment
- NCCA, DES, JCT, SEC
- Pressure and stress
- Thanks for the survey

# 1. Teaching Experience of Teachers

In this section teachers were asked to indicate the number of years for which they had been teaching.

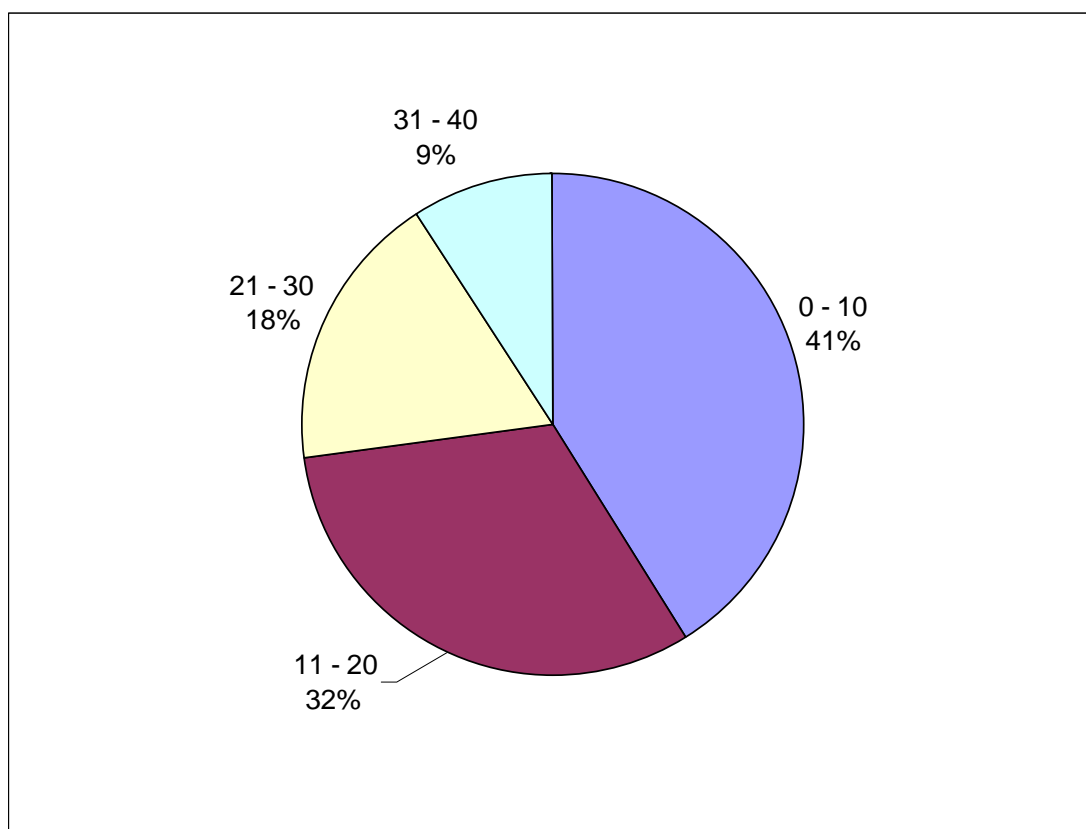


Figure 1.

## 2. Level at which teachers teach

In this section teachers were asked to indicate whether they are teaching at secondary level, third level or primary level.

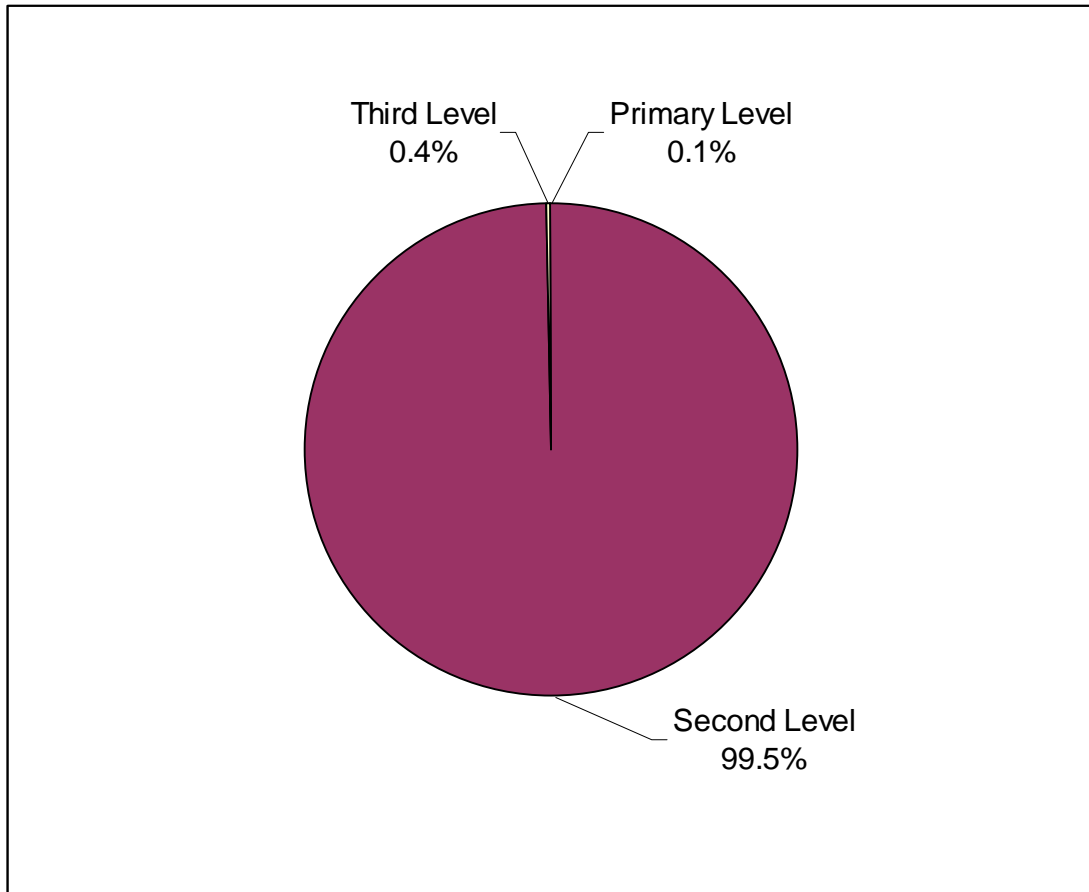


Figure 2

### 3. Category of schools in which teachers teach

In this section teachers were asked to indicate the category of school in which they are teaching.

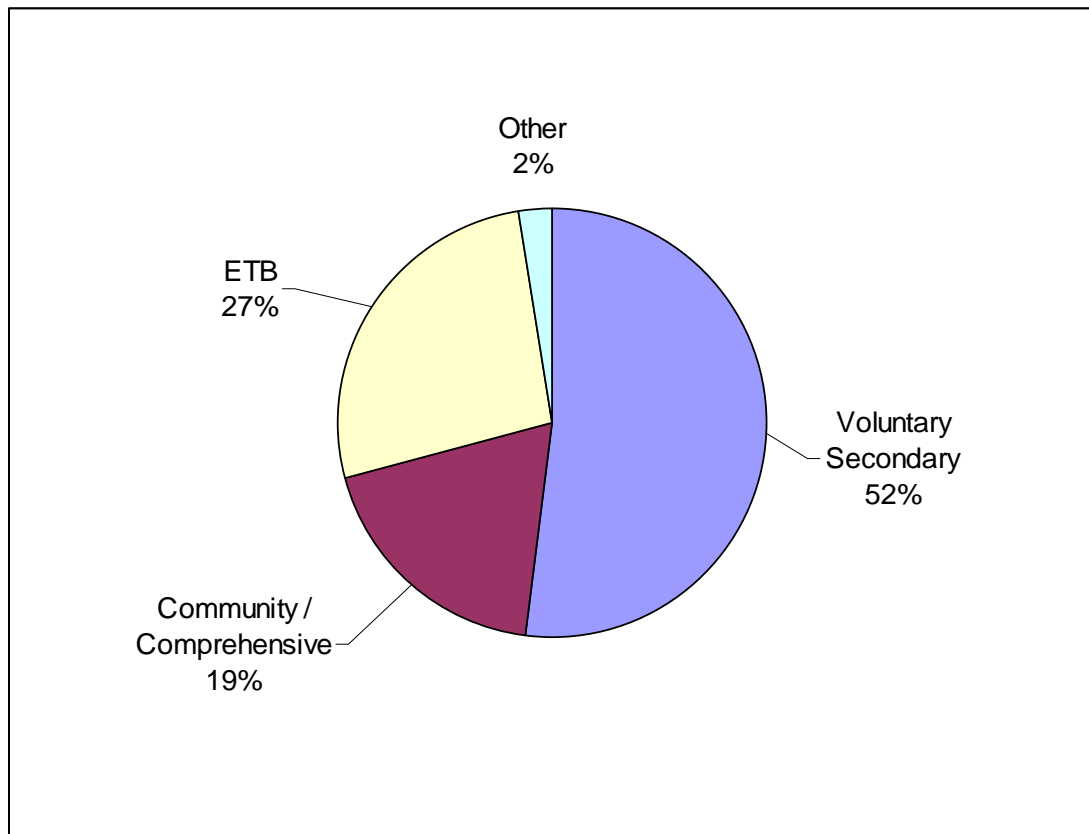


Figure 3

#### 4(a). Time allocation per week for teaching science to first year pupils

In this section teachers were asked to indicate the number of minutes allocated in their school for teaching science to first year pupils.

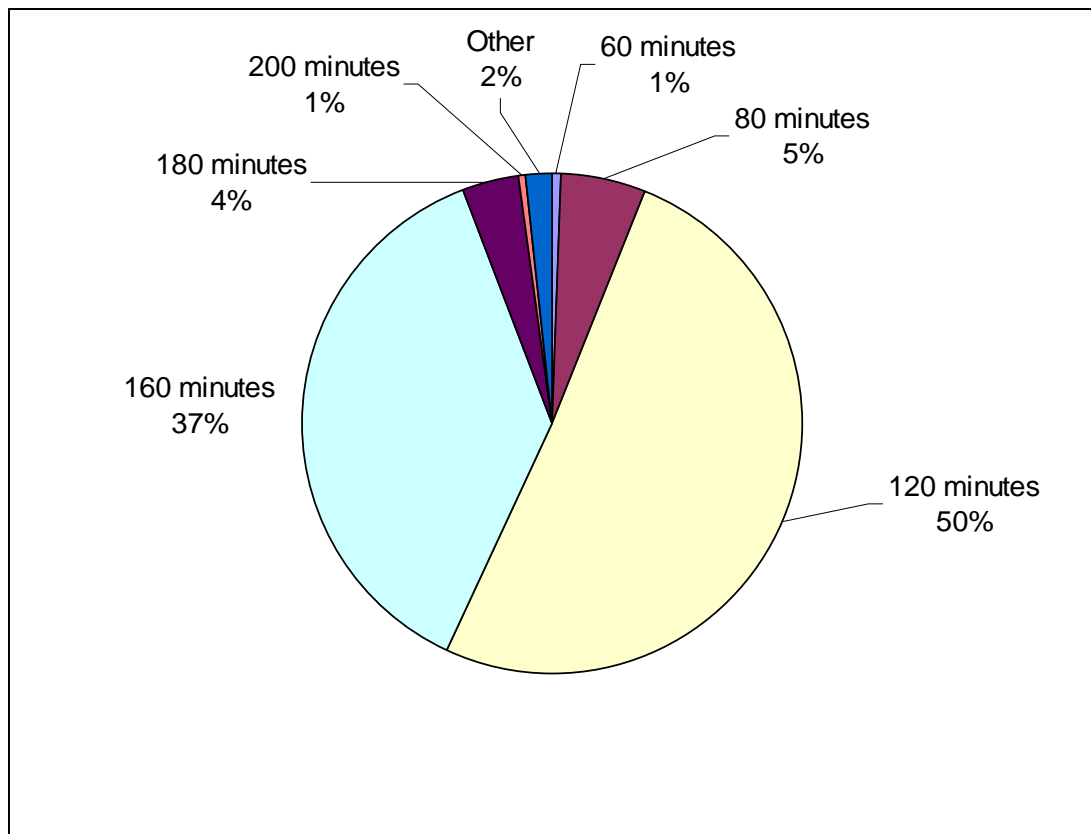


Figure 4(a)

#### 4(b). Time allocation per week for teaching science to second year pupils

In this section teachers were asked to indicate the number of minutes allocated in their school for teaching science to second year pupils.

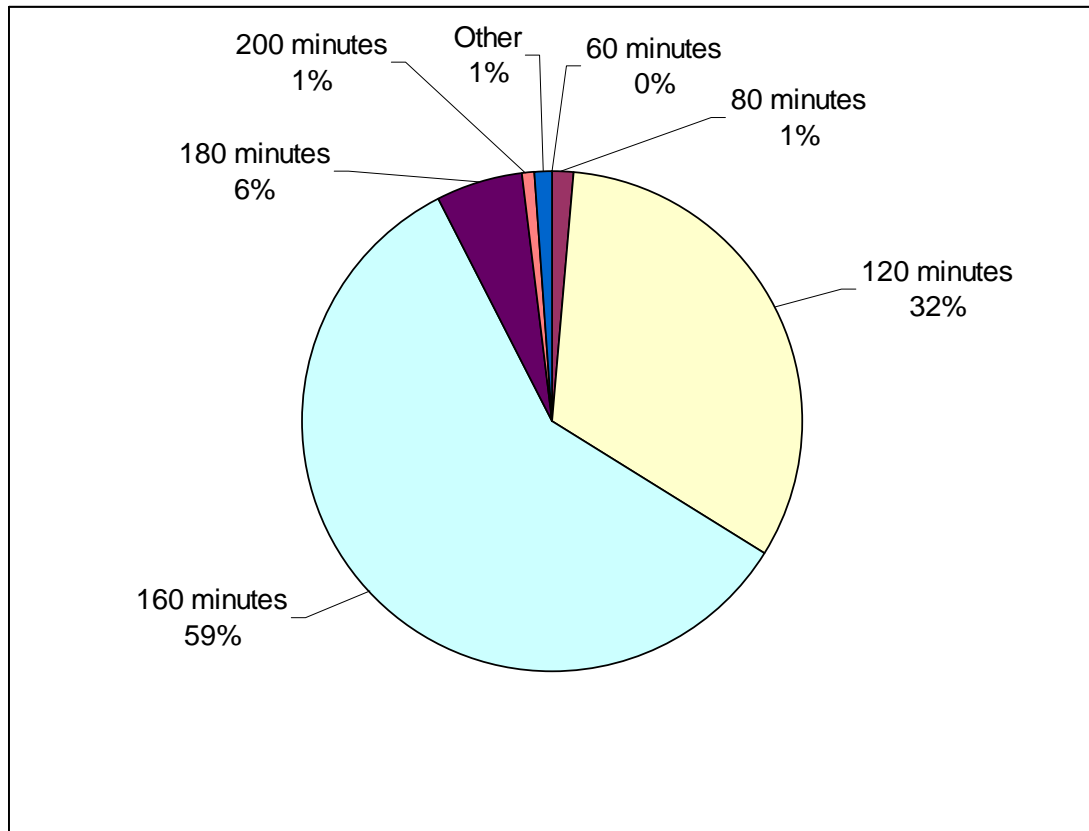


Figure 4(b)

### 4(c). Time allocation per week for teaching science to third year pupils

In this section teachers were asked to indicate the number of minutes allocated in their school for teaching science to third year pupils.

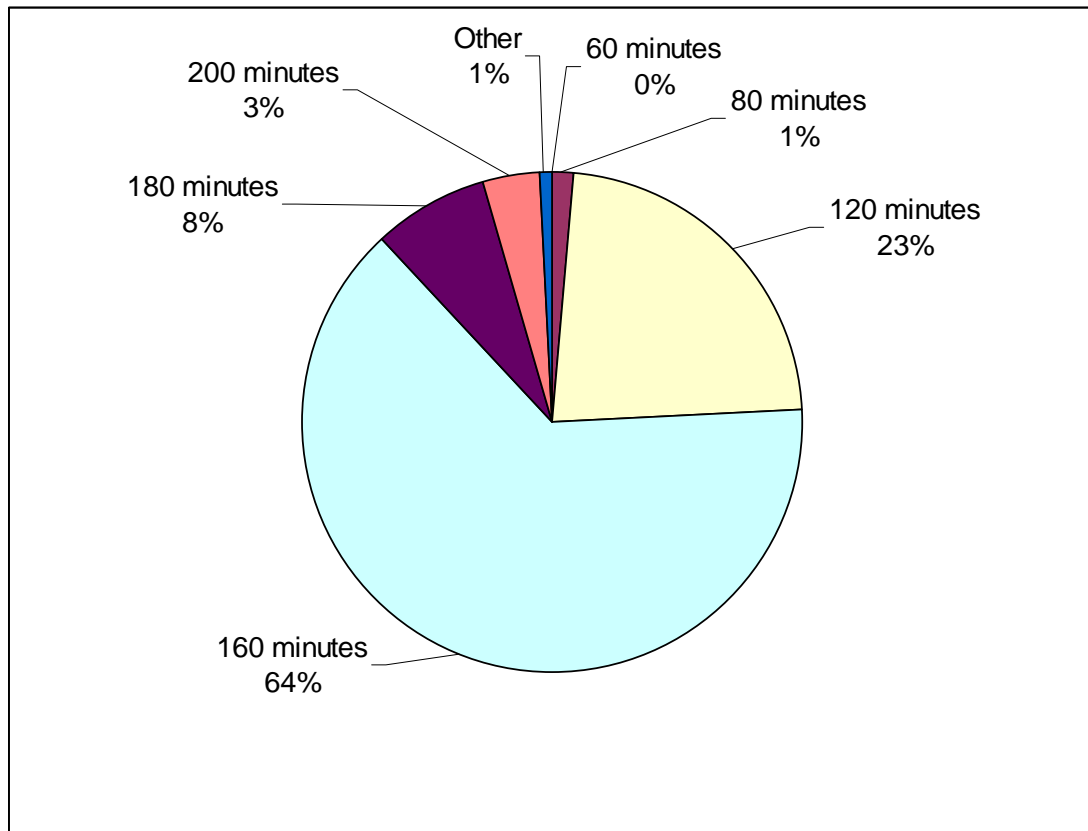


Figure 4(c)

## 5. Involvement with the JCT in the provision of CPD courses to practising teachers

In this section teachers were asked to indicate if they were involved with the Junior Cycle for Teachers Support service (JCT) in the provision of continuing professional development courses to practising teachers.

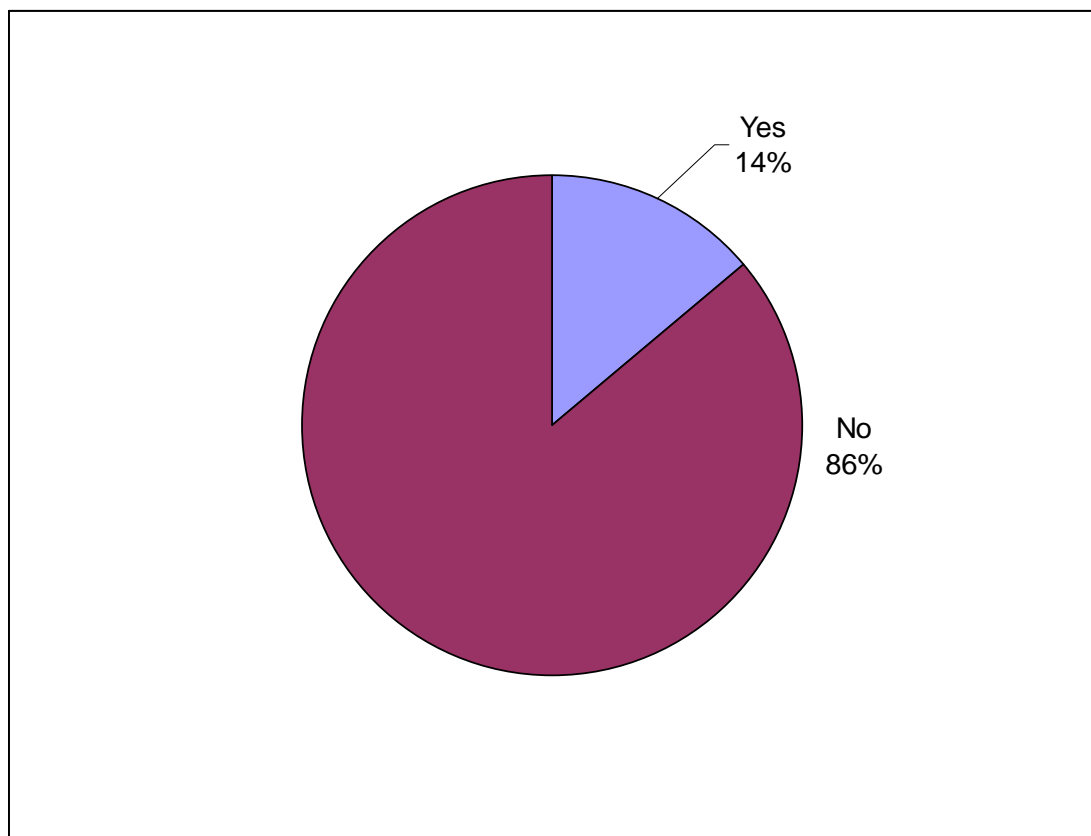


Figure 5



## 6. The role of Classroom-Based Assessments in the Junior Cycle science course

In this section teachers were asked to indicate if they felt that the two Classroom-Based Assessments (Extended Experimental Investigation, CBA1 and Science in Society Investigation, CBA2) have a valuable place in the Junior Cycle science course.

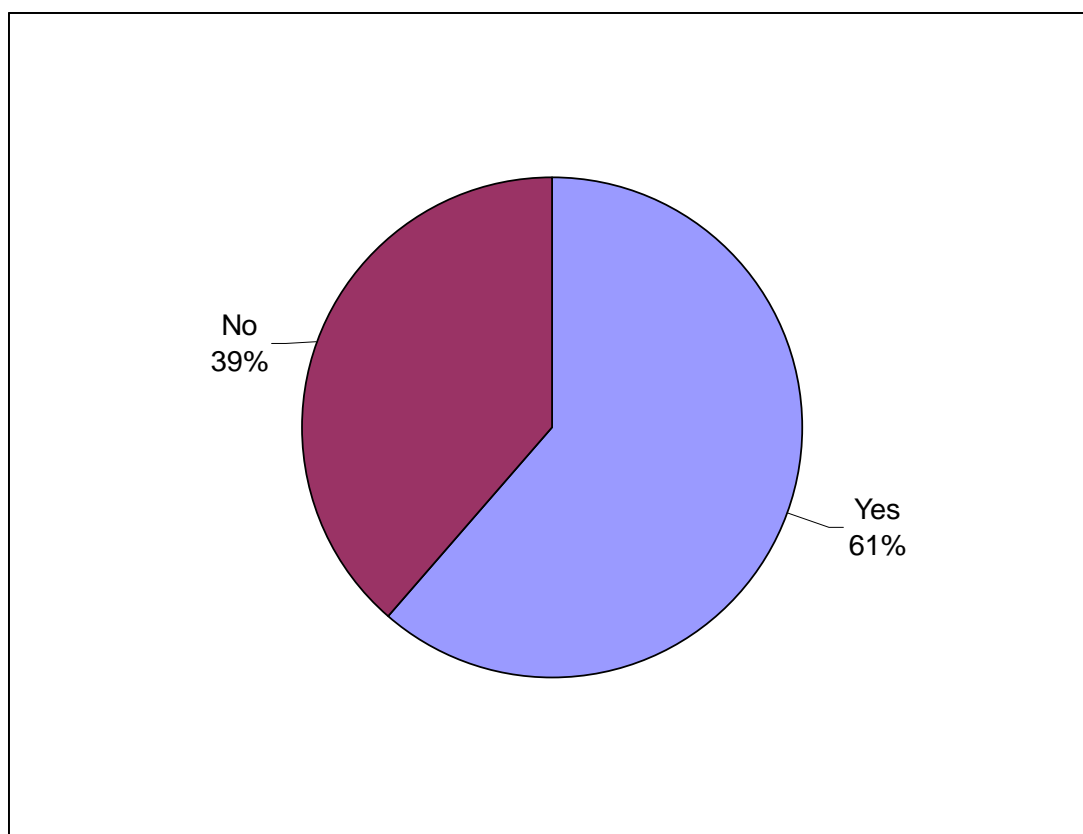


Figure 6

A number of themes emerged from the analysis of data in this section

### 6.1 Gives students a chance to pursue an issue in which they are interested

A number of teachers agreed that it gives students a greater opportunity to work on topics that interest them.

*The students get to choose a science experiment (CBA1) or a science in society investigation (CBA2) that is relevant to them. This approach is far better than the previous science course.*

*Absolutely, allowing students to get involved in research that interests them is crucial to developing an interest in science, as well as an appreciation of the relevance of science to their lives. I can see my students growing and developing an inquisitive*

*approach to their daily lives. It is heartening to see them question results and sources of information and make arguments based on evidence. I have also noticed that their ability to argue constructively and see both sides has improved over time. I am heartened to think of the type of citizens they will be in the future regardless of the path they taken in life.*

*Getting the students to create and complete their own experiments is invaluable and fun.*

*EEI (if done correctly) allows students to answer a question that they are interested in through experimentation. It also allows students to get to grips with the scientific method in a meaningful way.*

*The SSI teaches the students to self motivate themselves and highlights the importance of finding reliable sources. This indirectly teaches critical thinking, and how to spot unreliable sources. If done correctly it allows students who normally do not perform well academically to shine.*

*Yes it engages the weaker pupils*

*They encourage investigative skills and research skills which I think are very valuable. They also empower the student to take responsibility for their own work and promote independent learning*

*I personally feel that my students learned a lot from carrying out the EEI. I also found that I enjoyed doing it with the students. It is a pity that the students could not have used what they learned in the EEI for their 2nd CBA. However, the SSI was a much more difficult task for the weaker students and I found it more difficult to coordinate etc.*

*The students are so engaged. I was sceptical but am converted. Student voice is very motivating for them*

*They give students the opportunity to experience how research works in a more engaging and realistic manner than the old coursework B and they show greater independence when they choose their own topics. Less able students often do well and show increased enthusiasm for science.*

## **6.2 Mark associated with CBA should count toward JC grade**

A number of teachers commented that a student's CBA results should contribute towards the student's overall science grade.

*Yes but they should carry more weight towards the exam.*

*But I feel the students should be given a % of overall result for so much work.*

*They have worked well, but there shouldn't be two parallel systems. They should count towards the JC mark. They need to have more weighting, 10% is too little*

*I think they need to have a percentage allocated to overall grade to make them meaningful to students. I would like to see more samples of work per descriptor*

*Should be graded and percentages towards final result in JC*

*Students develop and practice skills needed for a role in science but I feel more than 10% should be assigned to these tasks.*

*I do feel that they have a place in JC science but I think that the students should be rewarded more heavily for their hard work. A descriptor is not enough for the amount of work and effort students put into the CBAs.*

*They are good experiences for the students to have but are hard to justify with no value in the assessment*

*The students learn a lot from doing the CBA's. However it is disappointing that they are not getting a % of their Junior Cert exam for the CBA's. It seems a very unfair result for a students as they are putting a lot of time and effort into their CBA's and it is not reflected in their results. Compare this with 25% for Coursework B in the old syllabus. The students worked hard to get as high a mark as possible in that situation.*

*Poorly represented in allocated grade. Good skills.*

*Good to get students working independently and thinking scientifically in terms of fair test and biased sources. They need to be worth more than just a comment for the work and effort students put in. Should be worth a portion of final grade like coursework b.*

*Allows students the chance to become scientifically literate, however them not being worth any percent particularly when the assessment task is only 10% is cruel.*

### **6.3 Development of new skills**

A large number of teachers stated that students develop new skills in practical work and that research and investigation lead to independent learning

*Students developing their lab and research skills is vital for a career in science or just life in general*

*My current students are so much better at investigating, thinking like scientists, seeing connections between things. Researching has opened up such fantastic discussions. Old course was boring and just focused on learning off. The CBAs help bring this course to life. Parents delighted too, with opportunity of students to show different skill sets.*

*EEI - Yes as they let students carry out the experiments they were interested in and generally they enjoyed the experience*

*SSI I feel that this is a hugely difficult task with students with dyslexia or any other SEN requirement. I think that they are 15 and being asked to critically analyse topics and sources a skill that most people teaching the class did not have skills to do until*

*they were in 3rd level. My most able students loved this but feel weaker students struggled with this and required a lot of assistance in this CBA.*

*They enable students to take on independent data gathering and research tasks and practice the skills necessary to understand the scientific method.*

*It gives students an opportunity to investigate, research and critique work as scientists.*

*They allow students to practice the scientific method and research as a scientist.*

## **6.4 Value placed on CBAs**

A minority of teachers felt that students place no value in CBAs, seeing them as worthless.

*Worthwhile skills for students but if they find out they're not "worth" anything they can tune out. (Percentages)*

*Need to be worth more (higher percentage) and second year CBA needs to be worth something*

*I do but they are not really related and so the second years and third years don't see it*

## **6.5 EEI worthwhile but little value in SSI**

Some teachers agreed that the EEI was worthwhile but saw little value in SSI component.

*CBA1 was fantastic but CBA2 did not work as well. Teachers need more support so we know how to research things correctly and then we can include research throughout the 3 years of junior cycle*

*I am concerned the SSI while it has merit is a copy and paste exercise with a lot a parental influence.*

*I think they are valuable but I think the SSI should be in second year and the EEI should be in third year*

*I feel that both CBA's have made an improvement to what was an outdated junior cycle science. The EEI is an excellent way to see how the students implement the scientific method as well as affording them an opportunity to carry out a practical investigation. In terms of the SSI, while it has its merits it will improve in the years to come, I feel that teachers were poorly guided in terms of this CBA especially in terms of grading this with a descriptor as the guidelines outlined were quite vague and more samples of work should have been produced. The assessment task was also misleading and I feel that it is not that challenging for students.*

*I feel both have value but I question the marking criteria of the SSI. What's to prevent students copying and pasting information?*

## **6.6 Extra workload and lack of facilities are some of the issues relating to CBAs**

A number of teachers commented on the extra workload for teachers, even though they agreed it was a good learning experience for students but there was frustration at the lack of facilities available, there was also concern about time and money being wasted

*Marking is difficult though as their teacher.*

*There is an added amount big work for teacher and students with EEI & SSI*

*However, they are allocated too much time. Also, there needs to be clearer assessment guidelines to distinguish between exceptional and the other categories.*

*Allowing students to be more creative. EEI limited by resources. SSI research done at home...limited by lack of computers*

*Valuable but very difficult considering lack of facilities including equipment and ICT*

*EEI was very good. Students embraced it but difficult to have all necessary equipment and access to labs.*

*It is time consuming but students definitely have a positive experience. However school matches etc. can have a huge impact on their ability to finish.*

*It's good to let them explore science on their own - too much time is given to it though*

*The EEI is a good addition - nice for students to design and carry out their own investigation. Many schools would have encouraged students to do similar projects in the past anyway - don't understand the huge fuss and paperwork in just getting teachers to carry out classroom projects with students - massive waste of time and money from education budget on trying to sell CBAs. I don't think the SSI is as beneficial to students.*

## **6.7 EEI should be done in third year with SSI in second year**

A minority of teachers felt that the EEI should be done in third year with SSI in second year.

*However I do feel that they should be swapped. Any second year can do internet research but students would benefit from completing their course before being asked to invent an experiment they may not have covered the relevant content before attempting this in second year.*

*The EEI more than the SSI.*

*Practical experience is of value to junior students, a great challenge to critical thinkers. They were both useful, but I would like to have an element of experimental work as a 3rd CBA. Having said that I would not want to do the SSI with second year students as it would be more difficult for them*

*But should be done the other way around. SSI in second year and EEI in third year.*

*CBA 1 a good replacement for coursework B as its less formulaic. CBA 2 however is probably not a great addition in 3rd year. Students at that stage are unable to search and lit review as don't have the skills. Maybe move CBA 2 to 3rd year and have two CBAs in 1st and 2nd might be a better idea.*

*I can see why it is practical to assess the students ability in both these areas, but I do think it would be much more beneficial to have the SSI in 2nd year and EEI in 3rd.*

*The EEI CBA 2 has a benefit and should have an assessment task after it and should be in 3rd year but the SSI teaches very little science for the amount of time students spend on it.*

*They were both useful, but I would like to have an element of experimental work as a 3rd CBA. Having said that I would not want to do the SSI with second year students as it would be more difficult for them*

*CBA 1 a good replacement for Coursework B as its less formulaic. CBA 2 however is probably not a great addition in 3rd year. Students at that stage are unable to search and lit review as don't have the skills. May be move CBA 2 to 3rd year and have 2 CBA 1s in 1st and 2nd might be a better idea.*

*The EEI CBA 2 has a benefit and should have an assessment task after it and should be in 3rd year but the SSI teaches very little science for the amount of time students spend on it.*

## 7. Time availability for teaching the Classroom-Based Assessment activities

In this section teachers were asked to indicate if they had adequate time to teach the Extended Experimental Investigations and Science in Society Investigations in the spirit in which they are intended.

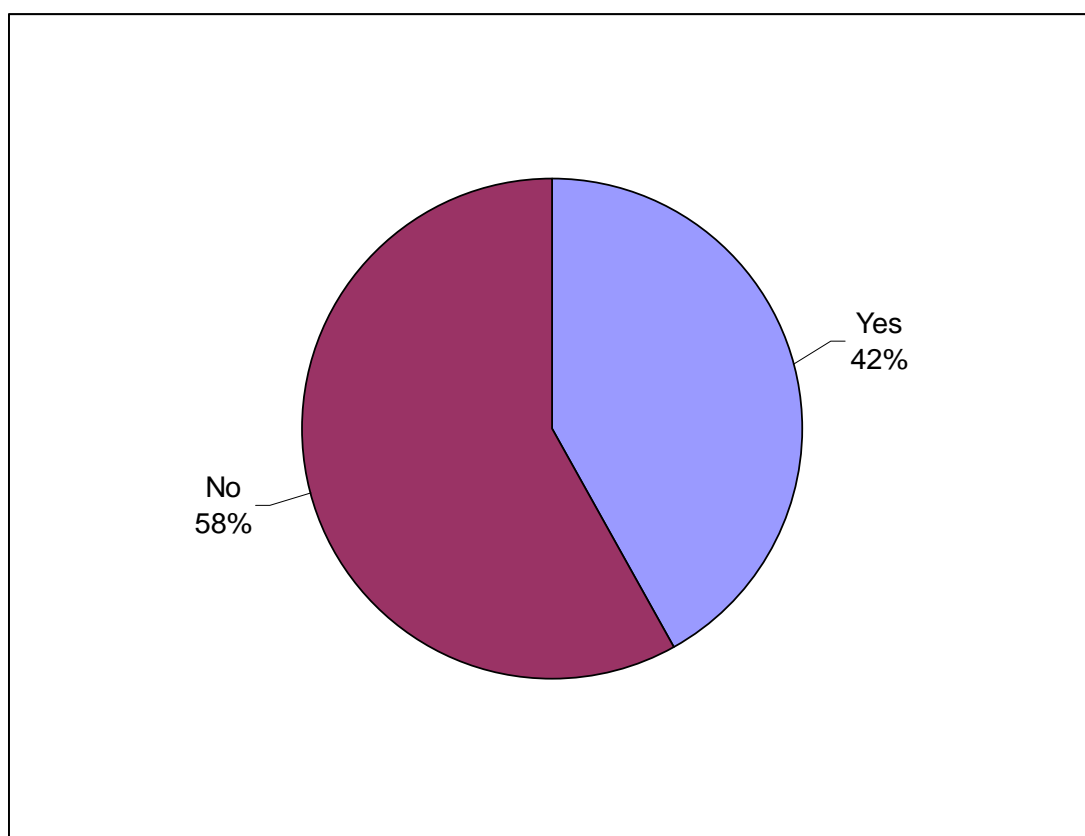


Figure 7

### 7.1 Specification (syllabus) too broad, not enough time to devote to EEI and SSI

A large number of teachers commented that the concept behind EEI was worthwhile but they raised concerns that the curriculum is far too long and as a result time is an issue.

*Three periods a week is too short to truly develop the skills we want students to have. I feel like we are doing everything briefly as a result and that skills cannot embed when we do things so quickly.*

*The course is still too content heavy and does not allow enough opportunity to explore experiment writing*

*The three weeks is adequate to carry out the CBAs. I think if it was much longer the students would lose interest in their investigations/research. However the skills that the students need to conduct the CBAs need to be developed prior to the three week period.*

*This is difficult to develop and still cover course material with a reduced time allocation.*

*I am concerned that this time is being taken away from the time needed to cover the Learning Outcomes.*

*No the course is so broad we have no clue what to put in or not.*

*However I feel that the course is so broad that we are rushing everything. Also I feel as we may lose a class period as the new JC intends that we will not have enough time in the future. 3 class periods a week is not enough to ensure we are giving them a good basis in Science and also embedding a love of science. It is just about enough time to cover the course with very little time for self-discovery.*

*Thinking skills are required but no time allowed for students to develop these.*

## **7.2 Teaching time allocation**

Time allocation was a major concern with the majority of teachers pointing out that there must be enough time in the week given to the subject.

*Given the 4 class periods in each year I'm at an advanced to other schools I know of.*

*This makes it easier for me to complete it as intended. Access to computers becomes an issue and is becoming more of an issue as more subjects come on board and also as they've extended windows for completion*

*At the moment we have 160 or 200 (third year) minutes class time per week but this is likely to be reduced.*

*With current time allocations I do but I am confident that we were reduced from 4 classes to 3 classes in 2nd and 3rd year, then I would struggle*

*We still have 160 / 200 mins per week*

*Due to the number of hours we get allocated in the Junior Cycle Science I am able to teach this.*

*All teachers in our department dedicate 3 full weeks of class time to each of the investigations and in my experience this is more than sufficient. With 4 periods of Science allowed for each year group I do not feel putting these 3 weeks aside puts me under too much pressure to 'cover the course'  
3 weeks of 4x40 min classes is appropriate..*

*Our school allows 160 mins a week for three years. This is essential to develop all elements and aspirations of the new course*



*In 2nd and 3rd Year, with the 4 period allocation, I feel we have enough time.*

*Management have restructured the timetable so Science from this year on is now 3 x 40 min periods a week. I definitely think this will impact on my ability to teach both CBAs effectively.*

### **7.3 Difficulty with lab access and computer access**

A number of comments highlighted issues regarding access to computers and internet access.

*3 weeks is enough for both. Not all schools have access to computers all of the time so it can cause some problems when you have 100 students using 30 computers*

*Yes but feel student should be rewarded for this work . Also, it is difficult for teachers who are sharing labs.*

*Given the 4 class periods in each year I'm at an advantage to other schools I know of.*

*This makes it easier for me to complete it as intended. Access to computers becomes an issue and is becoming more of an issue as more subjects come on board and also as they've extended windows for completion.*

*Access to computers is a bigger problem. Time allocation is adequate.*

*Plenty of time especially with revised schedule now we not clashing with Business for computer room research time.*

*3 weeks for EEI as I is perfect and the 3 weeks for SSI as is probably too long as students don't have internet access in our school.*

*Too much classroom based organisation for EEI, equipment a availability, lab availability, safety with students working on their own a lot with too many different investigations going on at same time, trips and school activities and sickness eating into three week time, having to make up time at lunch and after school*

*Three weeks is sufficient if and only if the computer labs are free at those times*

*Ideally more time in the laboratory*

*Year 1 was ridiculous as we had our cluster day 2 weeks prior to the CBA, EEI, students had no experience in the process, teachers had no experience either. This experience can now be incorporated into yearly activities to help prepare students for the process. CBA 2 the SSI experienced difficulties in access to ICT facilities. Not all students have access to wifi or internet in the home. Leading to high demand for access to computer labs and printing facilities. Enthusiastic parents definitely tilt the scales in favour of their children through reviewing h.w for and constant communication with teachers. students with parents from non academic backgrounds tend to fair less well in the CBA.*

*I do but I feel more computer access is needed*

*I think there is enough time for students to complete this process the resources are readily available during that particular class time. For some groups the computer rooms are fully booked up for the year at their particular class time which can add huge difficulty*

*Booking of computer rooms is difficult.*

## **7.4 Students missing time due to other activities**

Many comments expressed concern at students missing time due to activities such as matches, events and mock examinations.

*Yes I think the 3 weeks is adequate time for the work to be carried out and the way it was changed to be more flexible across subjects is ideal. I do feel students missing for matches and school events though could be an issue when more subjects change*

*I do feel like it would be difficult to complete the projects in the 3 week slot if students are not able to work at home or if there was something that led to you missing a double class or a number of classes.*

*3 weeks is adequate if all in and no interruptions*

*I feel I have enough time to do so, as long as there are no absences during that period. From a whole school perspective, the removal of designated days means it is more difficult to arrange inter-school sports fixtures now. At least when everyone was active in their schools one knew that there was a "no go" time.*

*Yes but we need to accept that any extra-curricular activities (either on the teacher or students part) will be taking a hit.*

## **7.5 Stress levels for students and teachers**

A number of teachers made reference to increased stress levels for both students and their teachers.

*As a Science Department we feel we are continually under pressure time wise to fulfil the requirements of the specifications. We definitely need more time to teach the skills needed for the EEI and SSI*

*Students overwhelmed by CBA's in other subjects - saying that even before all subjects are in.*

*SSI requires research which takes time to allow students to explore and grasp the idea of reliability in their sources. At this age some students are not proficient at using computers and this lends itself to massive time wasting within the 3 week window*

*My first years only see me twice a week (for one single class and one double). As a result I am not getting as much done in 1st year as I would like and that causes a problem when they get to 2nd year, as I feel that we have to try and make up for the time lost in 1st year. Also because of out of school activities there are many weeks*

*when I miss the double class with the first years and they only see me for 40 mins during that week. Because of this the students are starting to see Science as a subject that doesn't have as much "importance" as there is often a problem with continuity. Under pressure to complete course, even with the 160min allocation in third year. Absolutely terrified as to where I will be with my current 1st years when they will be in 3rd year. Being down a 40 min period each week means progress through course is very very slow.*

*The syllabus is so extensive and given that the marks awarded towards their final grade for each are so low or nil, that it is adequate. They couldn't be given more time, and it would stress students given it accounts for so little in regards to marks. The merit of them is not fully understood*

*But the rest of the course is rushed. There doesn't seem to be as much time as we thought/ were told there would be for independent learning/ research.*

*I have enough class time, however the corrections and individual feedback is adding greatly to my workload.*

*I feel under huge pressure to complete the course in general, mainly due to the uncertainty r. depth to which various/all topics need to be covered.*

*As a result of time constraints in covering the broad course content for the terminal exam (worth 90%), I feel that I can't give more class time for advice in approaching the CBA's in an effective manner. Most of the student preparation work is conducted out of class contact time.*

## **7.6 Recognition of the importance of the CBA**

Some teachers raised issues with regard to the recognition of the importance of the CBA.

*A lot of time is allocated to the CBA however the written exam still counts for the majority of marks allocated*

*The syllabus is so extensive, and given that the marks awarded towards their final grade for each are nil, that it is adequate. They couldn't be given more time, and it would stress students given it accounts for so little in regards marks. The merit of them is not fully understood*

*Considering they are worth so little of the final grade I feel I would not give them any more time.*

*No. With the rest of the course to get through and a 90% exam to prepare for it's too tight for time.*

*Yes but efforts deserve proper % recognition in grade not just a sentence . 3 weeks long enough to spend on a piece of work that receives such poor recognition.*

*Adequate but there should be percentage towards final mark for the amount of work involved. A lot of time is allocated to the CBA however the written exam still counts for the majority of marks allocated*

## **7.7 Sufficient time reported for completion**

A number of teachers agreed that current timing gives students sufficient time and a greater opportunity to work on topics that interest them. A number expressed fears regarding time going forward as the contact time is to be reduced to 200 hours across the board.

*Yes I do have enough time.*

*They have been developing and preparing since first year. Of course there is time.*

*If teaching first years using the scientific method then EEI is no big deal*

*We have enough time*

*Yes, it is appropriate*

*Three weeks is sufficient time*

*Yes. 120 mins per week is more than adequate*

*I am saying yes, but actually the answer is I DONT KNOW. We will know when I have the 3 yrs completed. The advised allowance seems adequate so far.*

*I feel they are prepared for the EEI as they have plenty of practice of designing and carrying out an investigation, so they know what is expected of them from the start.*

*The three weeks gives them a week to plan, week to conduct the investigation and a week to analyse their results and evaluate their investigation.*

*It does mean that they have to be careful in what investigation they decide on as a week may not be enough time for them to get meaningful results.*

*I felt they were less prepared for the SSI as they had very little practice of evaluating sources or writing an essay in Science. This may be a skill I will attempt to develop prior to them starting the CBA rather than just providing information about it at the start of the CBA. They are in the middle doing CBA 2 at the moment but I think 3 weeks is plenty of time.*

## **7.8 Problems posed for weaker students**

A number of teachers mentioned this and made the following comments;

*There are some weak students, with poor attendance that this just doesn't suit. I try to give them as much autonomy as possible but I find, with weaker students, there is not enough time for them to try a method, see it doesn't work and then refine it. As a result I find myself guiding them more than I feel is beneficial to their learning.*

*Some students have adequate time. Weaker students maybe could do with more assistance*

*I am happy with the concept of EEI but I feel some special needs students will still find it hard to reach the level of achieved and this will further knock their confidence in this subject. This isn't a time factor. I haven't yet had a third year class, but dealing with resource students, this seems more manageable than the EEI. I also found regarding the EEI that many students were very stressed with having to come in with their own ideas and some needed help in this area. I like that I am more in control of when the EEI will be done in my class, rather than being directed from the outside as to when.*

*Weaker, unmotivated students lose interest after a while*

## 8. Level of satisfaction with assessment criteria / Features of Quality for Classroom-Based Assessment activities

In this section teachers were asked to indicate their level of satisfaction with the assessment criteria / features of quality that are used in the assessment of the Classroom-Based Assessments 1 and 2.

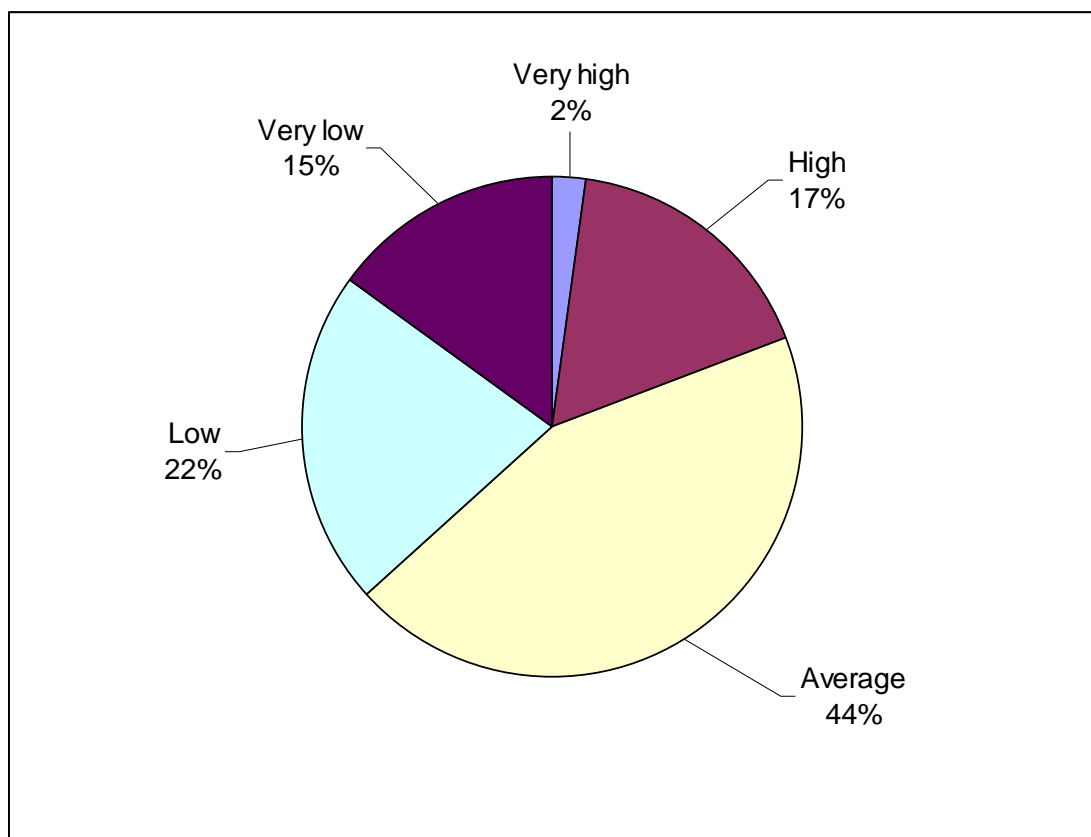


Figure 8

The following themes emerged from the analysis of the responses of teachers.

### 8.1 Features of quality

When asked about the features of quality for classroom-based assessments, the word most frequently used in teachers' responses was "vague".

*Features of Quality need to be more specific what do they consider to be a large number of balanced sources? What do they consider to be a sufficient amount of good quality data what do they consider adequate?*

*The features of quality were probably not definitive enough, e.g. when doing research how many sources of information is considered broad?*

*Some features of quality are the exact same for two descriptors...how can you decide where to mark the students then?! Also, there isn't an option to tick where students go that have done no research or simply have no research question. They are not clear enough and will lead to far too much subjectivity.*

*The grade brackets lack clarity. In CBA 2 some of the criteria is the exact same in different brackets. When the brackets were different they were vague, for example "from an example" and "for a large example". This is supposed to be a national standard. This results in teachers using their own discretion, which will have a different standard depending on the teacher. This ambiguity will make it difficult for students to improve and to fulfil their maximum potential. This ambiguity in the criteria does not protect the teachers marking the CBAs and leaves an opportunity for students or parents to challenge the grade they are awarded.*

*The criteria are not clear enough while the refusal to provide examples of exceptional and yet to meet expectations means it is difficult to differentiate between all four descriptors. Numerical values should be attributed to the criteria, more sub-criteria and more detailed criteria used.*

*The criteria need to be discrete. There is too much overlap for effective discrimination between the different attainment levels.*

*The criteria are very vague and open to interpretation. Hence, I do not take them very seriously. The fact that the first set of criteria had to be changed at the last minute by the NCCA, shows that they are also struggling.*

*There is a lot of ambiguity between the features of quality, as some features are extremely similar. One teacher's interpretation of one piece of work might be totally different to another's.*

## **8.2 Objectivity in assessing students' work**

Many teachers expressed concern that the features of quality are open to interpretation and, thus, very subjective.

*...these are far too subjective and open to interpretation. I was told these features would be held as a national standard but that cannot be the case as they are not clear and far too vague.*

*Not fair as you know students and its very hard to be objective no matter how hard you try.*

*As every student could potentially have a different CBA and insufficient numbers of samples were provided of all descriptors, they are open to interpretation.*

*It lends itself to lots of different interpretations and personal opinion.*

*There is no set standard. It is down to each teachers understanding of the criteria, which itself is poorly explained.*

*The SSI features of quality are good, there's a clear distinction between the different descriptors, the EEI is far too subjective e.g. the difference between Above and Exceptional in one instance is that an exceptional project gives more detail, what is considered "more"?*

*I feel the grade bands are very wide. It seems a little unfair to have such a range of ability/completed work receiving the same grade descriptor. Also, it is very difficult NOT to be subjective while marking.*

### **8.3 Use of Features of Quality in assessment**

There were mixed opinions expressed regarding the use of the features of quality to assess students' work. Many teachers commented on the difficulty they experienced in trying to interpret or apply the criteria. Others felt that the criteria were easy to use or provided an opportunity for students to reflect critically on their work and self assess.

*The bullet points within the features of quality need to be separated out more. Within one bullet point there are often 3 different outcomes to be assessed which makes it extremely difficult to judge whether it's been achieved or not.*

*Some features of quality are the exact same for two descriptors...how can you decide where to mark the students then?! Also, there isn't an option to tick where students go that have done no research or simply have no research question. They are not clear enough and will lead to far too much subjectivity.*

*Features of quality for EEI not clear enough. Sometimes students fall into in line with expectations for one section but exceptional for another. Unclear if each bullet point should be weighted the same when marking. Also, no section to mark a student down if large sections have been copied from the internet. I feel that this will not be marked at the same standard in different schools.*

*It is almost impossible for a student to reach an "exceptional" grade within the time-frame available, if all work is done in class and with only "reasonable support". The features of quality are not written in language which is accessible to students. There are no annotated examples available of "exceptional" or "yet to meet expectations" student work, in order to "clarify the meaning and interpretation of the Features of Quality".*

*I find it very difficult to distinguish between the different criteria when there is only a difference in one word. For example give resources, consider resources and evaluate resources. I'm not an English teacher what is the difference between each of these?*

*Plagiarism is not taken into account on the Features of Quality.*

*Often many criteria in a sentence. Very often a student has satisfied some but not all and therefore make its difficult to assess.*



*No problems, easy to use. By students and by myself and peers. We (teachers in my school) use them regularly for self assessment and for peer assessment.*

*There is a certain amount of ambiguity when deciding between the descriptors, but this keeps students critical of their work and provides opportunities for discussion. If this was simplified then students could easily produce work that met the exceptional descriptor without being truly exceptional and without much effort.*

*Clear. Would be nice to have a concrete example of each level updated yearly.*

*Anything less and there would not be a level playing field. Anything more and it would be too intrusive into the process for the students.*

*I found the assessment criteria for CBA1 clear. I also thought that they dealt with issues the students would have. I found the assessment criteria for CBA2 were difficult to clearly explain to a student. I found when marking them that it was tricky to discern between consider and evaluate and. For the CBA2 I was very frustrated that students who had copied and pasted their entire project still achieved yet to meet expectations for 5 mins work. I found it difficult to monitor the students work for CBA2, it was much easier in CBA1*

## **8.4 Standardisation in assessment**

A number of teachers expressed concern that the vague and subjective nature of the features of quality would make standardisation of the assessment of CBAs impossible.

*...these are far too subjective and open to interpretation. I was told these features would be held as a national standard but that cannot be the case as they are not clear and far too vague.*

*Features of quality for EEI not clear enough. Sometimes students fall into in line with expectations for one section but exceptional for another. Unclear if each bullet point should be weighted the same when marking. Also, no section to mark a student down if large sections have been copied from the internet. I feel that this will not be marked at the same standard in different schools.*

*The grade brackets lack clarity. In CBA 2 some of the criteria is the exact same in different brackets. When the brackets were different they were vague, for example “from an example” and “for a large example”. This is supposed to be a national standard. This results in teachers using their own discretion, which will have a different standard depending on the teacher. This ambiguity will make it difficult for students to improve and to fulfil their maximum potential. This ambiguity in the criteria does not protect the teachers marking the CBAs and leaves an opportunity for students or parents to challenge the grade they are awarded.*

*Very vague, concerned that interpretation of assessment criteria can vary from school to school and that there is not a standard assessment of all students.*

*Parts are vague and when JCT is queried on it they leave it up to the SLAR meeting per school to evaluate. This doesn't ensure fair grading across all schools*

*Not reflective of the student ... a weak student always achieves weakest grade regardless of effort ... Absolutely despise the language used in grades ... Yet to meet expectations especially .... Also features of quality need to be 'unpacked' (like the learning outcomes) for the student and, like the learning outcomes, may be open to very different interpretations in each school*

*Even at inservice the group of teachers I was with had very different standards when we looked at samples of students' work. This makes me wonder how fair it is.*

## **8.5 Level of fairness to students in Features of Quality**

Many teachers felt that the features of quality are unfair to students at both the top and bottom ends of the ability spectrum. In particular, teachers felt that the features of quality are not fit for purpose when assessing students with special educational needs.

*Attaining the higher 'grades' is near impossible for the majority of students and demoralizing the weaker students who may have made, for their abilities, a huge effort.*

*I believe there should be 5 categories and that the majority of students should be expected to fall in the middle category, not in the second last category as with the current format. I also do not like the term "in line with expectations".*

*They are adequate for CBA1 but for CBA2 the expectations for what the students should be achieving is too high.*

*I do not think that 4 brackets is sufficient, especially if the top bracket is designed for the top 3% of students nationally. This results in the vast majority of students falling into the middle two brackets. This results in a huge range of quality across these brackets.*

*I think that this has a negative effect on students. Students may become disheartened when they compare their work after the first CBA and can see the range of projects that fall into each bracket. This may have a negative effect on students, as it will become difficult to motivate the students to improve their work as it may seem futile to improve their result. ...*

*... I think the names on each bracket do not help assess each individual student. By using grades, it assessed the student's knowledge, but by using the terms "expectations achieved" it has put the emphasis on a student's effort. However, if a weak student has tried really hard but has missed the mark, by the marking criteria their effort cannot be taken into account, but it is reflected in their grade.*

*Weak students can do a wonderful investigation by their standards but the criteria do not allow acknowledge this.*

*Students are only 14 or 15 and their cognitive ability hasn't developed enough for them to achieve exceptional target. Why have a target that is so unachievable?*

*I would like to see some recognition offered for the experimental work itself as some students can do some fantastic work but can struggle to present a decent report so it would be nice to see some credit offered for this.*

*I find the difference in quality between someone on the cusp of above expectations and someone on the cusp of yet to meet is too great. Both students would be "in line" but would be moles apart in terms of quality. Unfair.*

*I think they are average but I also believe not every class of student represents the national bell curve and here the problem lies with the features of quality. I feel they are designed to pull the good students down into the middle and the weaker student up to the middle which I do not agree with.*

## **8.6 Language used in the Features of Quality**

A common thread running through the comments received from teachers was their struggle with the language used in the features of quality.

*Much too vague and very complicated for students. This is their success criteria. They should be awarded EXCEPTIONAL just for comprehending the features of quality.*

*Students don't understand these statements nor do parents, I mean 'In line with Expectations' In Line with whose?????*

*The Features of Quality for CBA 1 are fine. The features of quality for CBA 2 are very wishy-washy. Example some useful sources is not a quantity. How do 3rd years assess if particular information might bias scientific practices.*

*I found the assessment criteria for CBA1 clear. I also thought that they dealt with issues the students would have. I found the assessment criteria for CBA2 were difficult to clearly explain to a student. I found when marking them that it was tricky to discern between consider and evaluate and. For the CBA2 I was very frustrated that students who had copied and pasted their entire project still achieved yet to meet expectations for 5 mins work. I found it difficult to monitor the students work for CBA2, it was much easier in CBA1.*

*Language too advanced. The students cannot be expected at the age they are to completely analyze the finer points of the features of quality in order to achieve a higher comment.*

*On CBA2 the distinction between exceptional and above expectations is not exact enough. Some terms used are difficult to differentiate.*

*Many of the criteria are too vague/ambiguous. What does "uses an innovative approach that truly enhances the work" mean? How do we decide if a CBA is sufficiently innovative?*

## 8.7 Frustration voiced by teachers

Teachers voiced frustration with the specification as a whole, and with the features of quality in particular.

*They are rigid and expect too much from the average student. Very strong students are getting "in line with expectation" and are getting "above/exceptional" in business...this is going to have a knock on effect with the uptake of science at senior cycle as the students are perceiving their ability to be higher in business. I find it surprising that the JCT and NCCA want teachers to develop their own syllabus based on the specification, which is far too board and open to interpretation yet for the CBA which is worth 0% of their final grade teachers are given a rigid assessment criteria and have no input themselves. I would much prefer to have to come up with a grading rubric for the CBAs myself and actually receive a syllabus for the rest of the science course.*

*If there was a box with a satisfaction level less than "very low" I would have ticked it. They are so similar & it is totally subjective as to how u interpret it. Very frustrating.*

*One feature of quality relates to how much help a teacher gives student initially in helping student pick topic. In JCT inservice we were then told we should give students a lot of help here to scaffold them. There is an inconsistency here and when I questioned this further I got no satisfactory answer just told to use professional judgement.*

*So called 'expectations' appear a grey area where in one cluster day we were told to lower and raise expectations in accordance with the student in question. The latest cluster day revealed that no you didn't take the effort etc of a student into account but went solely on this 'Expectations' chart. Try explain these expectations to parents. A total grey area wishy washy.*

*It's like a word salad of buzz words that makes little sense and at the end of the day a "meets expectations" grade means almost nothing to both teacher or students. This whole CBA concept is clearly a fudge to do some assessment in class but give no actual percentage. Not sure what point it serves in teaching scientific skills .*

*Most of students cannot do well enough to encourage them to keep on science at senior cycle. Our CPD day puts 90% of students at the 3rd category, in line with expectations! Parents will eat us alive!!!!*

*I think it's a joke if the dept feel that these are suitable for distribution to students as success criteria- the language used is very difficult to decipher. I really struggled to see the point of the SSI.*

*Decent enough, but based on something which I consider a waste of time*

*Some students will be really stretching themselves to complete the EEI and still will not manage to achieve. I am also disappointed that the terminal exam in the JC accounts for more of the marks to form a grade than the previous exam. Previously the JC exam accounted for 65% of the grade. We probably shouldn't be so focused on the grade, but anything which relieves pressure and stress on students in my opinion*

*is a good thing. Placing so much emphasis on the terminal exam (now 90%) is a move in the wrong direction.*

*Teachers don't know what to teach or how to teach topics so how would they be prepared for leaving cert?*

*Disagree with class teacher formally assessing their own students. Ethically wrong.*

## **8.8 Impact on student wellbeing**

Many teachers suggested that this form of assessment would have a negative impact of both student and teacher wellbeing.

*I think that the design of the features of quality reflects unfairly on students ability. By having in line with expectations (from my interpretation where a student at 14/15 years of age would expect to be at this stage in their studies) as the second lowest band discourages students as they feel like they are at a lower standard than implied. I also feel like it is unfair that students are limited to the lower bands if unable to come up with their own idea as students can often work very well scientifically and present their work appropriately but struggle with the creative aspect of the project. While I understand the idea it can be difficult for them to think of these especially for the EEI.*

*The focus for the EEI is more on the written report than on the practical skills being demonstrated by the students. This adversely impacts on weaker students. Perhaps revisit the ISCIP programme.... Also the list is totally not user friendly for science teachers.*

*These courses highlights what science can be application of scientific concepts not rote memorization of facts. Letting the students follow a spark of an interest and the teacher can help grow that interest.*

*The label 'yet to meet expectations' is not a positive label to give to a student who has given their best efforts but due to learning disabilities or other circumstances does not achieve the 'in line with expectation' criteria. The features of quality for SSI are very blurred and subjective - I do not see how this enables all students across the national cohort to be assessed equally.*

*The descriptor names are discouraging for students- In line with expectations? Sounds condescending.*

*They are in my opinion subjective. We all want to be fair while also doing the best our students, and I don't believe that a student who works to the best of their ability should be told they are yet to meet expectations. It does not take into account individual student needs and is in my opinion very demoralizing for both teachers and students.*

*Stacked against the students who struggle academically.*

*I think the language for the features of quality need to be changed slightly. I feel that the "In Line with Expectations" phrase could be changed to something that can generate more confidence, such as "Achieved Expectations".*

*The students have no value on it whatsoever and have come to calling the CBAs in all subjects Couldn't Be Arsed! This is a reflection on how the assessment and the lovely words used affect the students and in turn how they value the process.*

## **8.9 Training and guidance**

Some teachers expressed their frustration at the lack of guidance and training they have received in assessing CBAs. In particular, teachers noted that no training was given on the use of the features of quality for the Science in Society Investigation.

*There is still debate at inservices about whether the majority or most is the descriptor you award. If a part of one feature is completed but not the other is that counted as one? 'Some' is subjective.*

*ABOLISH the "exceptional" category altogether. It's meaningless if we are never to award it ("once in ten years" - JCT Inservice course). The three remaining categories should be sufficient. The guidelines on how to apply the FOQs are too loose. The FOQs for CBA1 were changed just before the task with no guidelines on how we were now to apply them - at inservice we were given to understand that the majority of students should be "In line..." - was this to change with the revamped FOQs?*

*Also, the application of FOQs to students' work from school to school is a matter of concern. Standards and fairness very difficult to ensure without more guidelines.*

*Some of the descriptions in the features of quality are vague and open to interpretation. Given that there is supposed to be a common approach used by teachers all over Ireland, the features of quality need to be more specific. The training for how to use the features of quality was also vague. During in the last school year, in our cluster training session we did a mock SLAR meeting. Two different tables got different results. When we asked the trainer which of the results were correct, she asked us "Well what do you think?". I found this to be very unhelpful.*

*A little vague.*

*CBA 2 - TWO sample provided by JCT have been placed in different grading categories but both have 6 references. One states "some ref" and the others "completely ref list"*

*It is too vague, hard to interpret. They say that if they have the majority in one descriptor they should be awarded that one, its too loose and so, loses its value. Basically I can mark them how I want! Teachers want to be able to have strict guidelines that enables us to work professionally.*

## 9. The extent to which students will be prepared for the study of Leaving Certificate science subjects

In this section teachers were asked to indicate on a five-point scale their opinion on the extent to which they feel that students will be prepared for the study of Leaving Certificate science subjects by the Junior Cycle science syllabus.

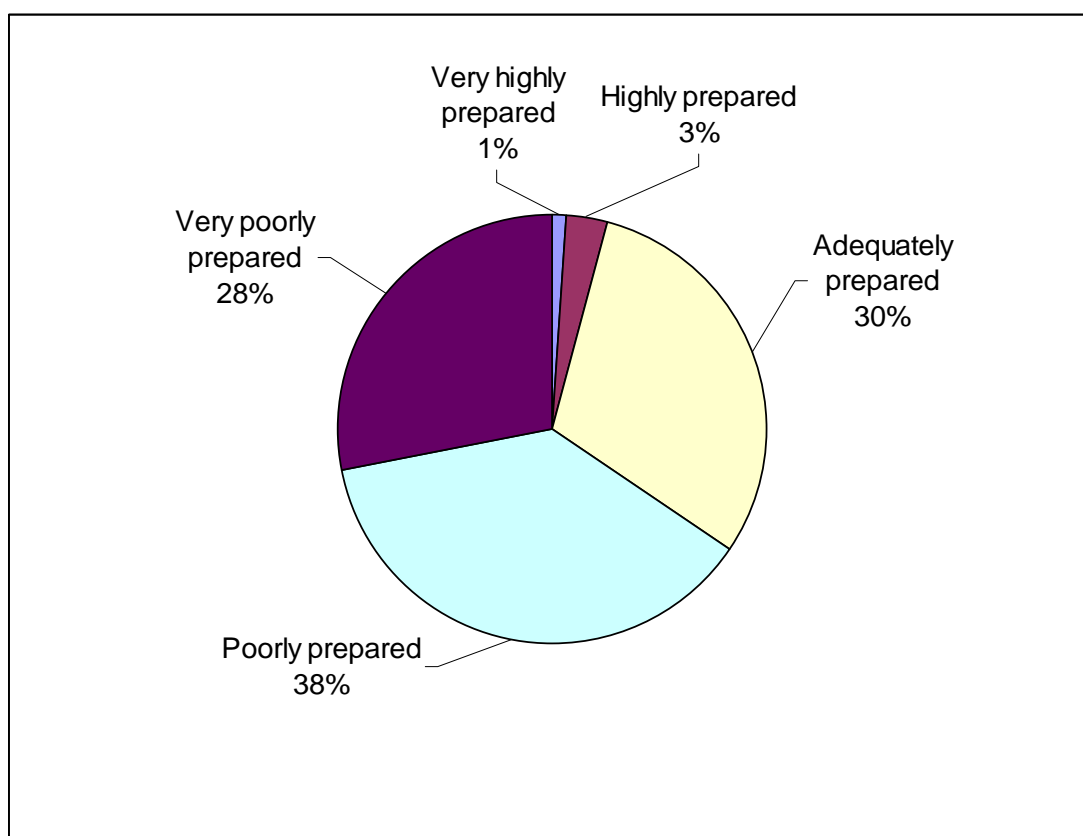


Figure 9

As can be seen from the statistical analysis, a total of 68% of teachers felt that students would be either poorly prepared (38%) or very poorly prepared (28%) for the study of Leaving Certificate science subjects. A number of themes emerged from the comments of these teachers.

Some of the recurring themes that emerged from the analysis of the qualitative data of Question 9 are now discussed

### 9.1 Depth of knowledge

A majority of teachers expressed concern about the depth of knowledge of the students. Some examples of comments made by teachers were:

*Junior cycle science is a skills-based/LO-based curriculum that doesn't prepare students for LC science. It is a wishy washy, mish mash of weak, media-driven, sound-bite science rather than solid basic science that will set students up for senior cycle, if they choose it ...*

*Lack of depth in their knowledge as the specifications are not clear and if teachers are not teaching the science subjects at senior level, they can get away with teaching very little as they will not be aware of what content is assumed they know coming from the Junior Cycle .*

*Emphasis on salient point/facts are gone and there is an abyss of knowledge lacking going into Chemistry. Physics is ok but biology is lacking too.*

*Students will be lacking in much of the basic content knowledge which is assumed to be known/familiar to them. Rigorous definitions, mathematical work and theoretical knowledge are things they will not have encountered in Junior Cycle. The skills they learn in JC are great to have, but not much use in Leaving Cert.*

*None of the topics are dealt with in depth. The JCT Science tends to focus on their ability to read and interpret graphs and a lot about energy where the building blocks are not dealt given enough depth. Reproduction in the flowering plant and bonding to name two that just came into my thoughts.*

*The science content which students need to know is very basic, students will be ill prepared for Leaving Cert physics in particular I feel. Without having any experience with magnetism, sound, light, limited interaction with other areas. The only difficulty in the new course is around research and use of language, scientific knowledge and application is secondary.*

*They may have developed a greater skill level in some areas, however, KNOWLEDGE is greatly diminished. Unfair on students as there is an inequality on what EXACTLY is covered by the teacher for each learning outcome - could be significantly different, from teacher to teacher or between schools*

*Urinary system, senses, skeleton, plant structure all gone in bio, chemical bonding merely brushed over in chemistry, light, sound and magnetism reduced to a mention in physics! Major dilution on all fronts, yet the LC syllabus the same. Matter of time before this diluted too, but surely that is not the solution!*

*Students can now finish Junior Cycle science without ever hearing the term "chemical bonding", will know nothing about the composition of the air or water treatment, will know nothing about light, sound or magnetism, will know nothing about static electricity, will not even be able to wire a three-pin plug, will know nothing about the skeletal system or muscular system, sensory system, the eye, plant structure, plant reproduction or tropisms. All of these topics serve as foundation stones for the study of the science subjects at Leaving Certificate.*

*The Junior Cycle has prioritized development of skills at the expense of knowledge and this will not prepare pupils for Leaving Certificate*



*Vague undefined syllabus, key scientific concepts neglected.*

*Students are unable to sit down and learn anything. They are lacking the skill of learning. Whether it is active or not students need to learn and retain information. I have found there is a decrease in interest in picking a LC Science subject compared to previous years gone by.*

*Students like to know what they are being asked and what answer is required of them to do well.*

*Not all the basic of science are on the specification. Example: no plant structure or basic plant knowledge. This requires more teaching time now at LC bio which is already tight for time. Basic physics and chemistry needs are not being met either.*

*Leaving Cert requires a high level of literacy, recall and theory. JC science focuses on skills and applications - students cannot recall any information!!*

*Their lack of knowledge in a number of areas is already showing and is of concern. For example students do not understand the important role of the kidneys in excretion, the process of reproduction in flowering plants, the process of bonding (essential to explain chemical formulas). All these topics are required in great depth at leaving cert.*

*Students will not have the solid foundation of scientific knowledge to prepare themselves for LC*

## **9.2 Lowering of standard of science**

The majority of teachers expressed concern about the lowering of standards in the new specification.

*The course is completely dumbed down and those that may go into stem careers are not getting enough teacher time to develop their aptitude for the subjects.*

*Lacking basic scientific principles for senior cycle science subjects. Dumbed down syllabus with no emphasis on learning information.*

*The body of knowledge with which they move forward to senior cycle with in chemistry, biology and physics is so watered down it will be a massive struggle to bring them up to speed to begin teaching any of these subjects at senior cycle...dumbing down comes at a high price...god love these students if they ever opt for a 3rd level course requiring the sciences....*

*I feel science is dumbed down!*

*The course goes all over the place but only touches on things briefly. Jack of all trades and master of none.*

*The gap will be massive. While I like the junior cycle approach to critical thinking and understanding, overall the junior cycle has been dumbed down in terms of*

*content. Even the type of questioning is very different. I think students will struggle. The removal of higher/ordinary level will cause confusion.*

*The level of detail and understanding required and indicated for Leaving Cert science subjects is far removed from the vague "understanding" success criteria of the Junior cycle framework.*

*The learning outcomes are very general with emphasis on doing rather than learning. This skill of learning is essential for senior cycle and third level.*

*All students now taking a common level, not good for preparing for definite LC levels. Basics on heat, light and sound are now removed/optional from the course. Having no set experiments to cover means that students prior knowledge entering LC science, will depend a lot on their JC teacher and what they decided to do.*

*The lack of depth of treatment with respect to the learning outcomes is going to have an impact. For example the learning outcome Chemical World 5 refers to using the Periodic Table to find ratio of atoms in compounds yet at no stage mentions ionic or covalent bonding. I could teach this ratio and never mention these key terms and fundamental aspects of chemistry.*

*The physics section of the course is very short. Standards are "dumbed down" across physics, biology and chemistry.*

*Basic scientific principles are not being taught now. We are teaching them how to find out information not the information itself*

*Not prepared at all the better students want to learn and the new science course does not place value on this and the vagueness of the course does them an injustice*

### **9.3 Gap between Junior Cycle and Leaving Certificate**

The majority of teachers felt that the gap between Junior Cycle science and Leaving Certificate science subjects had widened.

*The gap has widened even more students will struggle with the high demands at LC on theory .*

*Course does not prepare students at all for senior cycle chemistry. Very concerned.*

*Before the Junior Cycle Science there was already a big gap going to senior level. I believe this gap is going to widen with reduced teaching time and time spent on CBA 1 and 2.*

*There is no comparison. The new Junior course is almost "paint by numbers", the jump in the level of detail required for Leaving Cert is galaxies away and ultimately I think will put students off the sciences, or in my worst fear scenario the Department will read that as....let's dumb down the Leaving Cert so the new Junior Cycle doesn't look like a failure!*

*There was always a big gap, but now it is CAVERNOUS!! Imagine going to LC Chemistry and never having heard of an Ion! It is now possible.*

*Massive gaps in knowledge going into Leaving Cert Biology, cannot comment on the other science areas.*

*The jump from Junior Cycle to Senior Cycle has widened. Some of the basic concepts will need to be taught to bridge the gap, putting increased pressure on students and teachers at senior cycle.*

*Bridge between theoretic knowledge at junior and theoretical level at leaving cert is immense. Junior students will be completely lost on entering senior level.*

*Their knowledge of some of the basics that are required in Leaving Cert science subjects will not have been taught which will mean that courses which are very long in LC and difficult to get finished in time will now be pushed even further to get completed. The fun will be gone out of the subjects and will be just taught to exam papers.*

*Because no two teachers doing any of the same material at anything approaching the same depth, not sure what basic scientific knowledge any students will have on topics such as Force, Energy, atomic theory, human or plant biology, experimental write ups, chemical equations, Electricity to name just a few. Having completed this new course I'm not sure what exactly they will have really learned or indeed understood so will feel the need to almost begin from scratch when starting with students in Leaving cert. The jump from this common level paper to higher level present leaving Biology, chemistry or Physics is so huge are afraid they solution that will be to bring the senior cycle course down to this level.*

*The level of previous knowledge required for Leaving Certificate Chemistry is far beyond what they will have gained in the new Junior Cycles*

*We are now dealing with two mismatched syllabi: JCT is a skills based course, while traditional LC is a knowledge based course.*

*The attitude of the students coming out of their pre exams was that they could answer most of the questions without ever having been to a science class. This is very different in Leaving Certificate biology.*

*A lot of the content needed for LC subjects is gone. For example bonding in JC chemistry - it is no longer specified that ionic and covalent need to be covered so that will have to be covered. The vague nature of the learning outcomes mean that teachers may interpret them differently and so, may teach different things. For example in Biology, there is little or no mention of any plant biology in the learning outcomes. Whilst all teacher forums specify that we should be teaching plant reproduction, this has not been made explicitly clear by the department and so, students starting LC biology are starting from different baselines. The same in Physics - are the methods of heat transfer included? Is light included? So this will cause issues.*

*Many shortcomings one being lack of experiments being done all is lost in teaching of Science so sad after 39 years of teaching with excellent results teaching through experiments can teach science in classroom now all is lost*

*The topics have been watered down that unless there is a focused TY to bridge the gap the students understanding will be left wanting.*

*The parts of the course which have been removed to make room for the Earth and Space unit has resulted in students having no knowledge of key areas required for leaving certificate science subjects. There is no plant biology at junior cycle which makes up a large proportion of leaving certificate biology.*

*Common level is a problem. The sample paper is much easier than previous examinations and there are enough very easy questions to allow all students to 'pass'. They will not be ready for the level of effort, knowledge and skills in the LC*

*The Leaving Cert contains a lot of information that must be learned. This is not inherently bad, as i think with this information comes a lot of understanding. The current junior students have no experience with this from the current course. There are also large areas of the Senior science subjects that students will be seeing for the 1st time in 5th year, and i don't think we will have the time to go as slowly as may be needed to get back to par.*

*Students are finishing the junior cycle with a very basic and vague reality of leaving cert science. Interpreting information, processing it and understanding it is great in theory, but there's only so far a 15 year old can explore into that. It leaves a huge gap when they arrive at leaving cert level and all of a sudden have mandatory practicals, definitions and highly wordy questions that they have never experienced before, even at a more basic level.*

*No basic laboratory skills across the board with students. Not every student will enter the leaving certificate classroom with the same skills. No emphasis on writing as a scientist. As a biology teacher students have no introduction to plants except for photosynthesis and the plant cell. This is not sufficient for leaving certificate biology.*

*Depending on the depth of treatment by teacher on each topic this gravely varies from classroom to classroom never mind school to school. This leaves some students at a disadvantage in certain topics or areas*

*They wont have the scientific language or the level of English required for higher level biology. They won't have ever meet terminology related to most of the human systems. I'm worried for next year already!! They (students) have already dumbed down the language they need to answer the common level paper, ticking boxes, filling in blanks .. some shock next year.*

## 9.4 Concerns regarding physics

In particular, many physics teachers expressed concern for their subject.

*There was always a gap between LC Physics and JC Physics. However there is so little now of Physics in the New Junior Cycle, it will very difficult to encourage students not only to choose LC Physics but also to complete it...making it much more difficult.*

*..... I do not know where to begin with regards to LC Physics. I feel as if my course is decimated and I know that teachers are not giving Physics the same time to Physics as to Biology/Space/Chemistry. This course is going to be the end of Physics as a mainstream LC course.*

*Physics content has dramatically reduced which means students will telly truffle at leaving cert. No moments or lever on the junior cycle course and very little maths involved which is not an accurate representation of physics at leaving cert which requires a students to be a strong ordinary or decent higher level maths student.*

*I teach Physics. There is no way coming from the Junior cycle science curriculum, the students are able for the workload and intensity of leaving cert physics*

*I teach Leaving Cert physics and have serious concerns that those students who might actually choose my subject will be at a huge disadvantage to previous years based on the few physics concepts I have touched on at JC*

*As a teacher of LC Physics, I feel that most/many of the topics covered will require a lot more base knowledge teaching in order to get off the ground. Also, there is the risk of inconsistency; one teacher did teach heat transfer methods and others didn't. The uniformity of the students' knowledge will be affected.*

*Not enough physics being taught. Not enough practical experiments so much material. Physics is not just the solar system*

*As a physics teacher I'm forever worrying that no emphasis is placed on calculations and that some important sections at LC level can be omitted at JC in order to cover the specification e.g. Light and sound*

*The huge loss of many Physics topics will have an enormous impact on the future Leaving Cert Physics students. One positive I do feel will prepare students for Leaving Cert chemistry is the introduction of rates of reactions and exothermic and endothermic reactions.*

*Especially physics - can get through junior cycle without mentioning sound, light, magnetism, latent heat, heat. Also biology - no plant reproduction, excretory and skeleton and sensory system.*

*The new JC Physics in particular falls far short of providing a proper foundation for the existing leaving cert Physics.*

*Physics at JC has been decimated*

*AS a LC Physic teacher I feel the 'watering' down of content does not prepare students for the traditional LC course. There are now many gaps in learning to be filled. While it is argued that students have gained valuable skills they go into senior cycle lacking knowledge in specific topics. I will definitely have to teach a lot more core content (which would have been covered on the previous syllabus at JC)*

*They won't be very well prepared for physics at all. The syllabus needs to include more advanced detail to ensure that enough is covered to support leaving cert science students..... these students will get a big shock in fifth year*

*No physics left in junior cycle, students will be very unfamiliar. Assessment styles are very different and the absence of mandatory experiments on junior Cycle when they are mandatory at leaving cert is problematic.*

*The lack of Physics on the course will disengage students with the subject and turn them off. Also the amount of gaps in the course. Where are the basics such as light, magnetism, static electricity, heat???*

## **9.5 Adequately, highly or very highly prepared comments**

As can be seen from the statistical analysis of this question, a total of 34% of teachers felt that students would be either adequately prepared (30%) or highly prepared (3%) or very highly prepared (1%) for the study of Leaving Certificate science subjects. A summary of comments from these teachers is now given.

*It's just presumed in 5th & 6th yr that there is prior knowledge there. More time needed now in senior cycle to build up basics.*

*Skills will be good .*

*I teach Leaving Certificate so I will bridge any gaps!*

*The students will be able to think critically, analyse, reflect, research and hypothesise by themselves. These skills will be invaluable for the Leaving Cert and life itself.*

*I fear the students will have only adequate knowledge.*

*Science is science it doesn't change much. The research that the students carried out on their chosen topic was a great experience for them. It's great that they have the opportunity to actively participate in their own learning. Its the future. Gets them ready for 3rd level.*

*The Chemistry JC has stepped up in relation to LC Chemistry. So I feel students should be more prepared than previous.*

*The EEI highlights the scientific method which is the basis for all experiments.*

*Broad course lots of basic knowledge to form a good basis for LC*

*A lot of Leaving Cert science builds on Junior Cycle science so yes I believe they will be better prepared and able for Leaving Cert science subjects by completing science at JC level. I think it should be mandatory.*

*Better at coping with unseen questions and much better at analyzing data and using their science knowledge to apply to a new situation*

*It's a good course and kids are enjoying science.*

*As a physics teacher, teaching the physics topics will be well understood by my groups and lead very well into leaving cert physics. However I feel with a biology teacher and the physics section it could leave students very poorly prepared. As the syllabus is so open to each teacher and school, which will leave the subjects teachers don't enjoy themselves there most (not leaving cert subject) will be done at the minimum.*

*I'm nervous particularly for biology that there has been huge amounts removed from the old course*

*It is difficult to tell. While I believe it important to have introduced the nature of science strand and the sustainable element of the new course, some areas of the course are lacking e.g. not much about bonding, no skeletal system etc. Teachers will have to bridge some gaps for Leaving Certificate level*

*Aspects of the new Junior Cycle course that have been dropped include important concepts and skills for basic LC Chemistry, Biology and Physics that students will not have before entering senior cycle. Although their problem-solving skills and critical thinking skills will hopefully have improved!*

*Biology will be fairly okay. Chemistry not be very good at all. Physics reasonably prepared*

*This will certainly help students with critical thinking and problem solving than the previous course. The leaving cert is such a different style of questioning I think the students will find the jump difficult.*

*Although I feel that they will be more prepared in some aspects there are a lot of topics no longer covered in the junior cycle that will be used in senior cycle. They will be entering a brand new topic with no prior knowledge*

*Skills in investigations and thinking critically using data will pay off*

*Senior cycle does not match up with thinking skills element of JC*

*Too much variance in the interpretation of the learning outcomes.*

*They will be able to think! They will find having to learn definitions challenging but they will be able to investigate a problem, face new information and think through more complex challenges. They will be less afraid of meeting unfamiliar material.*

*As a teacher of Leaving Cert Chemistry I always found varying degrees of preparedness within the student population depending on the teacher who taught them junior cert science - if chemistry was emphasised then students were prepared however if this didn't happen then some students needed grounding even in basic atomic theory -*

*Study skills will not be properly developed. Teachers are limited by time and in-depth explanations are out of the question for the interested students.*

*Only problem is the course is to be done in a short time including two unnecessary CBAs*

*Teachers don't know what to teach or how to teach topics so how would they be prepared for leaving cert?*

*Better skill set is being developed but basic knowledge will be lacking.*

*They need to be able to memorise huge chunks of information for the current leaving cert so they will find that difficult but it was always a huge step up from junior cert to leaving cert.*

*They will be prepared and have an obvious advantage over students who have not completed jc science. However as the basics are all covered again in lc science subjects it won't make much difference.*

*The majority of my class are good and should be able for Leaving Cert science chemistry and biology- not so sure about physics though*

*They have no idea- if you used a text book as a support they will have some idea. I inherited classes where no book was used and presentations formed the content -not suitable in my opinion . You need a text book-students need a text book -they are too young and inexperienced academically to work without one -to even structure 3 years of revision!*

*Depends on the senior science subject*

*Vital parts of JC Bio, Chem and Physics not fully specified meaning we are left unsure whether to teach them in preparation for the LC or not to 'get through' the course*

*You teach subjects like Ag Science with no prior knowledge so I do not feel the jump will be as hard. We have to manage*

*No mandatory experiments. Everything so vague so depends on interest of teachers on what detail in topics given. Nobody will know what students have been taught and lots*



*of topics missing that needed for LC. Grades so vague so will not know if students able for HL in LC*

*There is nothing wrong with rote learning in certain cases. Picking up everything by osmosis in class is not an option.*

*There will be a big gap between JC science and biology. A lot of plant biology and the skeleton is left out of the JC course. I feel we are lowering the standards of learning and understanding in science that we have in our country. The common paper won't help weak students who won't read paragraphs. Students who are good at learning must now apply their opinion and they are not ready for that yet.*

*Biology and chemistry will be adequately prepared however physics students have very little material covered.*

*Incredibly worried about the physics students in particular. The sample papers so far show very little challenging physics*

*The fact that more independent work is carried out makes the students better independent thinkers and workers*

*Again, I truly feel they will be once I get used to teaching this course. But until then, I don't think they're getting the best of me or the course.*

*Syllabus is too open and key skills may be missed*

*They have a general grasp of science but the reality of the leaving cert might shock them*

*The EEI highlights the scientific method which is the basis for all experiments.*

*Highly prepared in some areas. There is less focus on scientific content, particularly plant biology and human biology. However they have gained some good research skills etc.*

*A lot of Leaving Cert science builds on junior cycle science so yes I believe they will be better prepared and able for leaving cert science subjects by completing science at JC level. I think it should be mandatory.*

## 10. Level of satisfaction with the SEC Sample Examination paper for Junior Cycle Science

In this section teachers were asked to indicate their level of satisfaction with the SEC sample examination paper for Junior Cycle science.

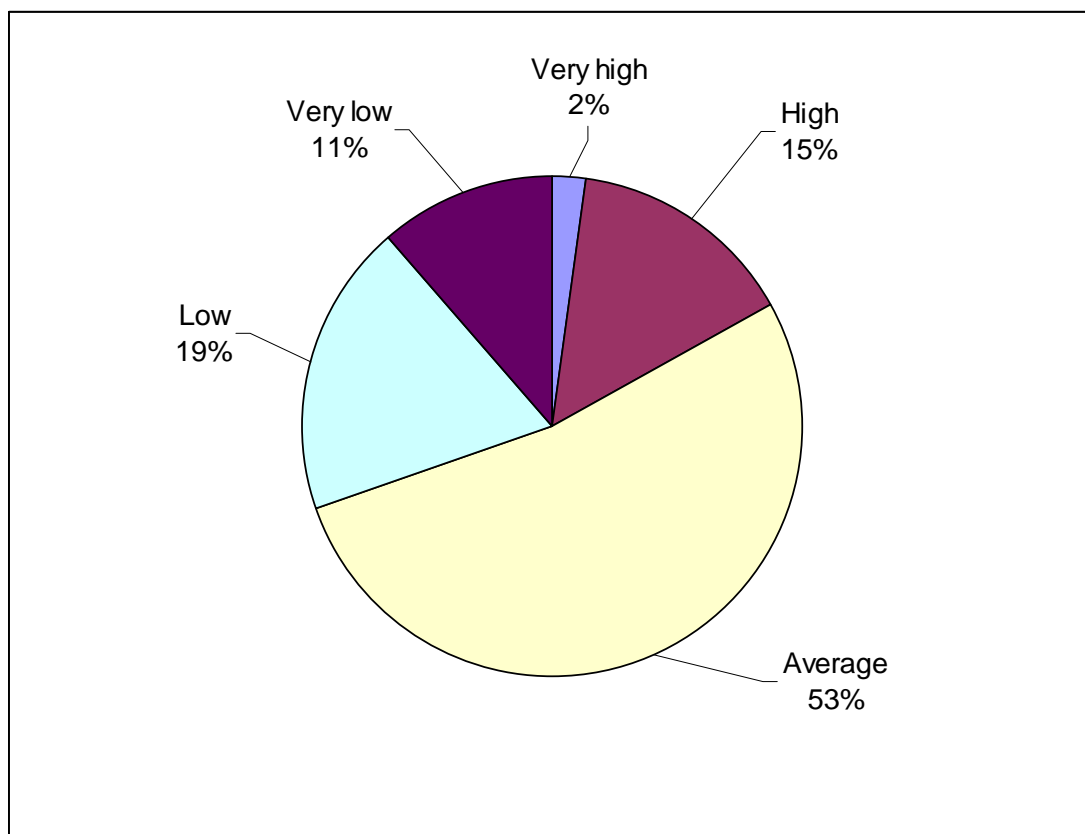


Figure 10

As can be seen from Figure 10, the majority of teachers described their level of satisfaction as average. The following themes arose from an analysis of the comments received.

### 10.1 Common level paper and standard of science

A wide range of comments were made on the fact that the paper is a common one and also on the standard of science being examined.

*I'm not happy with the question structure, I would preferred to see a smaller number of high quality questions that were differentiated within e.g. 2 average, 1 med and 1 hard part instead of a paper that is lower order at the start and higher at the end. I think weaker students will get to a section of the paper and give up*

*Too hard for weaker student, literacy level too high, no marking scheme/ indication of depth required, success criteria unclear!!! Question on evolution is case in point*

*Some of the question A questions were too easy while most of section B would be beyond the reach of less able students.*

*The standard of knowledge and analysing skills needed to do well in this paper are disappointingly quite low. This new style of question e.g fill in the gaps and then the necessary words are already given is disgraceful, it's far too simple.*

*Someone with a logical mind and good reading skills could pass this paper with no real science knowledge.*

*Standard is difficult especially for a common Paper.*

*Having one paper for all students is too difficult for SEN students and too easy for gifted and talented students.*

*My students said themselves that it didn't allow scope for them to "show off" their knowledge.*

*I believe it is a difficult paper and will test all students .I feel it is beyond the scope of the weaker student who is depending on this exam for 90 % of their grade*

*A common paper has to lower standards for more able/academic students while at the same time not allowing weaker students show what they have learned.*

*Not challenging in any way for the brighter students ....dumbed down ! My students had a giggle and realised they don't need to do much study , some of the questions are good as they have to decipher the answers but they are too easy .*

*I don't see a true challenge for the good student*

*As it is a common level paper then I am happy with it but students who do little to no work/study should still be able to do well which is not fair.*

*Too easy for students with no serious study done to get Achieved grade*

*Too simplistic and not enough physics*

*I feel that some questions will be difficult to correct as there are so many possible correct answers. Good maths students will score well in graphs without having any great knowledge of science. We are encouraged to use differentiation in our classroom, however it has been removed by having a common level.*

*Where's the differentiation!??? We're told by the inspectorate to "differentiate", but yet the SEC are not differentiating in their science sample paper and the NCCA are not differentiating in their specification....which should be called a syllabus, as it fails to be specific.*

*Will allow weaker students to pass and still has more difficult areas for differentiate the better students.*

*Well laid out excellent diagrams a nice challenge for a good student.*

*Very easy and vague. Dumbing down course again*

*The paper was as I had expected for common level*

*Good mix of questions*

*Thought it was very fair given it is common level. Plenty for weaker students*

*I felt that some of the 15 mark questions were too basic and the paper read like a dumbed down version of the Junior Certificate*

*I feel it has been dumbed down compared to higher level. High achievers and lower abilities have both been punished with a common level paper*

*Plenty of students could sit the exam without opening a book and get by. Common level is ok for opinions but we teach a diverse range of individuals who should be able to have access to higher order questions to push them*

*High achieving students not challenged at all. Little core scientific knowledge needed to do over 80% of paper. Too many soft science comprehension type questions that give less able students unrealistic levels of expectations for future senior cycle science subjects. Common level a joke when wanting to encourage serious STEM students. Why not have 2 levels as before? Majority of questions very low order and little emphasis on practical scientific knowledge.*

*They should be TWO levels at JC Science, the paper went from primary school science content, to JC science. The questions were so simple I gave it to a 12 year old primary school student and they achieved 70%. Level of content is a joke.*

*I feel it is accessible for the weaker student while still challenging the better able students.*

*It is accessible for all students.*

*Again, the discrepancy between this and the leaving cert is too large. I also feel I've wasted time trying to teach the specification when the paper is basically common sense.*

*We have accepted at this stage that it has really dumbed down the level of science so the paper was as expected. To be honest my 12 yr old primary school children scored 60% without ever having sat in a Science class..... he will need an excellent active teaching teacher to keep him engaged in 2nd level.. as the depth of the course will certainly not*

*Good questions and variety*

*Thought it was very fair given it is common level. Plenty for weaker students*

*Very simple and after 3 years work ticking boxes and no definitions is certainly not pushing students.*

*There seems to be no structure in terms of differentiation. I would like to see an Ordinary and Higher Level paper, as I have JCSP students and I feel the common level paper does not allow them access to achieve well.*

*Having one paper for all students is too difficult for SEN students and too easy for gifted and talented students.*

*There is too much emphasis on basic recall and the wide band for merit (55-74) reflects this as it does not give much incentive for many students to try break the 75% level into higher merit and distinction.*

*I believe it is a difficult paper and will test all students .I feel it is beyond the scope of the weaker student who is depending on this exam for 90 % of their grade*

*A common paper has to lower standards for more able/academic students while at the same time not allowing weaker students show what they have learned.*

*Not challenging in anyway for the brighter students ....dumbed down ! My students had a giggle and realised they don't need to do much study , some of the questions are good as they have to decipher the answers but they are too easy .*

*Not challenging enough for higher ability pupils and not suitable for lower ability*

*Very difficult to cater for both the very weak and very able students on a common paper.*

*Not balanced for weaker students, the longer questions put students with MLD at a distinct disadvantage. These questions on the paper are not accessible to all.*

*However, it may have lowered the bar. For example, student whom does little study for science may do well in the test even though it may not be as deserved as a hard working student. This results in students having false pretences in their ability for LC science subjects.*

*It is laid out in such a way that the weak students "should" manage to pass but challenging sections for the "good" students so a high grade will be well earned.*

## **10.2 Requirement for marking scheme to accompany sample examination paper**

One of the most common points made by teachers was that a marking scheme should have accompanied the sample examination paper.

*No marking schemes or guidelines were given*

*The sample paper effectively assesses the learning outcomes. However, without a published mark scheme, the level of demand and allocation of marks within questions is very hard to judge at this time.*

*Good paper but long. Marking scheme should be uploaded on the SEC website also to save time.*

*Useless without an indication of how it will be marked.*

*No marking scheme to guide ourselves or students*

*Sample answers would have been nice*

*No guidance on how questions should be answered. No "Success Criteria" provided by the SEC.*

*No marking scheme, so we are shooting in dark. Pathetic*

*Need a detailed sample answer paper and a detailed marking scheme to show depth of detail required in answer as there is no specific syllabus for depth of topic guidelines.*

*A single sample with no marking scheme is not enough to prepare with. Especially given the much changed style of questions which are much more open ended*

*The sample paper effectively assesses the learning outcomes. However, without a published mark scheme, the level of demand and allocation of marks within questions is very hard to judge at this time.*

*The paper really exposed just how much teacher's are being thrown under the bus here as regards the depth of treatment. With no national guidelines given, it is up to each teacher to interpret the outcomes. If the SEC interpret them differently then the students are at a disadvantage*

*Need more than one paper with some mark scheme as a guide*

### **10.3 Depth of treatment to prepare students for the exam**

Many teachers commented on their difficulty in knowing how to best prepare students for the assessment due to lack of depth of treatment being specified.

*Based on the vagueness of the syllabus, the low level of difficulty in the paper is needed.*

*I'm no wiser on what is expected or on what they need to know.*

*Making it up as they are going along. Extremely vague and very difficult to know as teachers if you are doing enough or teaching the right course as it's so confusing to follow the new course.*

*No happy at all. Many questions are very specific and not in line with the learning statements*

*It was incorrect in parts. One of the questions asked students to "describe" when the learning outcome was only "outline". You can't ask a higher order action verb. Also, some stretches were made with the learning outcomes that were not clear.*

*Does as well as it could given the vaguenesses of the "specifications"*

*Label the microscope? Not a learning outcome. Questions on testing gases - don't see that mentioned in learning outcomes why is that being asked ?*

*It's satisfactory for the dumbed down course that's now there.*

*Did not fit in with what we were told at the early cluster days.*

*Because we essentially design our own lessons from our interpretation of the specification it means we can overlook topics or the depth required in certain topics.*

*Students had great issues with some of the material. With learning outcomes without specific syllabi, how can you ask specific questions?*

*We were told no specific exam questions would be asked on the paper at both JCT training days and this didn't turn out to be the case*

*Good layout, but still very hard to know what to teach to students*

*It did not reflect the learning outcomes as much as I imagined it would. Lots of specific information as required not outlined in the learning outcomes for example the parts of the microscope.*

*Still does little to clarify the syllabus as a whole and leaves one wondering what may or may not turn up.*

*Sad to see what JC science has become.*

*It made sense when I read through the Specifications again, but I find it difficult to know what needs to be taught and not taught*

*I dislike the ambiguity regarding which experiments students have to know and how much depth they are required to go into for certain topics.*

*I feel like Learning Outcomes should be stated in black and white and NOT open to interpretation and "unpacking" with reference to an action verbs list which details several possible meanings for the action verbs. If the learning outcomes are open to interpretation by the teacher - the understanding of what is required will be variable. This does not make sense to me when students will be sitting a common exam. I don't feel it's fair. I understand that we are trying to move away from rote learning but I do not feel like this has been attempted in the best way possible. . . Also, I do not feel like I have adequate time to unpack the learning outcomes and carry out my plans in the way which is suggested by the JCT online.*

*The students feel like they are doing all this work and revision and then don't see many questions related to what they have been doing in class.*

#### **10.4 Number and timing of sample exam paper**

The fact that only one sample paper was released and the timing of this release was commented on by many teachers.

*One paper. Too late in the course. It has created a lot of anxiety in the better students in particular.*

*It came out very late and one is not enough*

*They should have been released earlier*

*Provided too little too late*

*A single sample with no marking scheme is not enough to prepare with. Especially given the much changed style of questions which are much more open ended*

*More than one would have been better.*

*Why release only one sample paper? The more resources and information for the teachers to use is surely better*

*The sample paper was produced two and a half years (TWO AND A HALF YEARS!) into the course. The common level paper will not suit weaker students.*

*One is not enough. There is a huge gap between what we expected would be asked and what was. With no list of mandatory experiments it is worrying they may ask one that my school may not cover due to lack of equipment.*

*One paper is not enough. A mark scheme would be very informative.*

*Additional sample papers would have been helpful to provide a more rounded view of the questions that could be asked.*

#### **10.5 Reading age and wordiness of the paper**

The reading age and wordiness of the paper was mentioned by a significant number of teachers.

*While there are some positives I was generally disappointed with the sample paper. I thought the layout and illustrations were excellent and I think it will serve to assess a wide range of abilities (which was the plan). I liked the variation in the questions - a good use of multiple choice in there too. It's very readable with a readability suitable for 8 & 9 year olds (is it too simple?)*

*Paper assumes that students all have a very high reading level, very much not the case for some. On the flip side it's not challenging enough for the very strong students.*



*Several very specific questions based on very vague learning outcomes. This is unacceptable.*

*Much of the paper could be attempted by a good primary school student with the ability to interpret data with no preparation. Meanwhile a significant cohort of students who work hard over the three years will remain unable to reach the level required in terms of reading, comprehension and analytic skills. Unfair and disheartening.*

*Too wordy in parts .. no indication of what detail required. Diagram of microscope... microscope not mentioned in LO's*

*Supposed to be a common level paper. Too much reading and information/data in some of the questions that the very weak students will struggle with and probably won't even attempt*

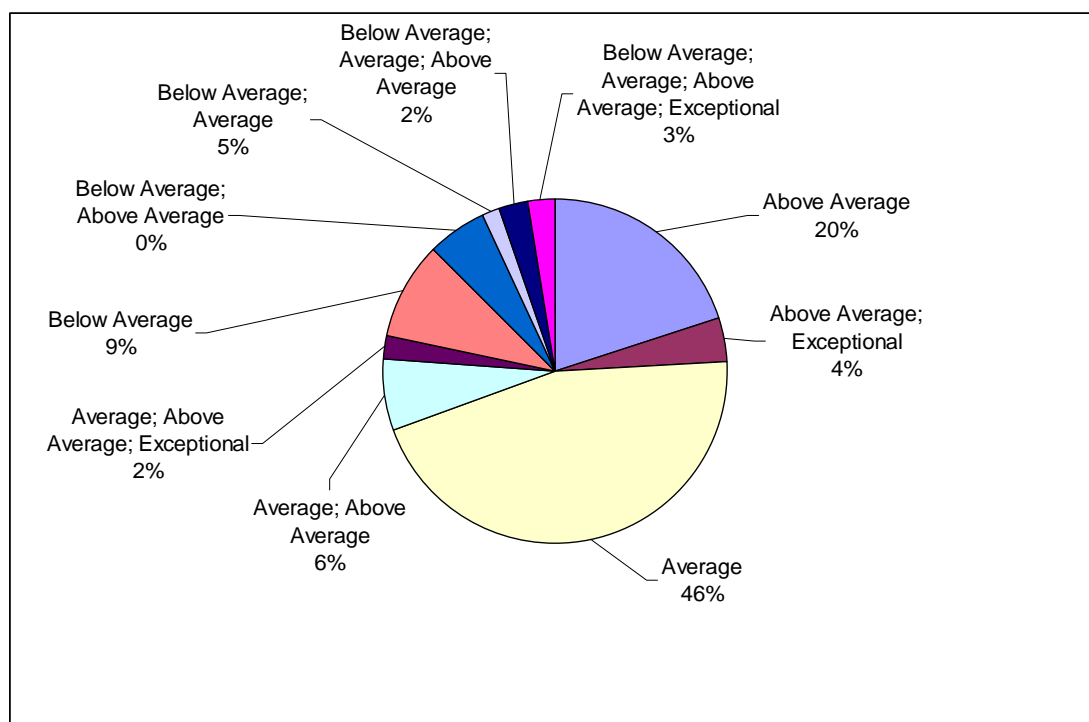
*Very wordy, very general, too hard for weak students.*

*Teachers and students will undoubtedly prepare themselves for exams based on this one sample paper, and may put their work and study in topics that may or may not appear on the actual exam in June. Language in the paper can be very inaccessible for many students.*

*Very wordy, very little testing of knowledge, could nearly pass it without studying which is not in line with expectation for 3 years of schooling*

## 11. Category of students for whom needs are being met by SEC examination paper

In this section teachers were asked to indicate on a five-point scale their opinion on the category / categories of students for whom they feel their needs are best met by the SEC examination paper.



It is clear from the analysis of the quantitative data that most teachers felt that the SEC sample examination paper was suited to the average student.

### 11.1 Weaker students

Many teachers felt that the weaker students would find difficulty with the exam paper.

*The common level paper means that no matter how hard a weaker student works they can never get a high grade. We want to encourage these weaker students and increase their self esteem. In the past these students could obtain a C/B grade at ordinary level and save face'. This increases their self worth and can encourage these students. With a common level paper they may not achieve/ pass and this has a knock on effect.*

*There is no provision for less able students. The current specification is putting Science out of the reach of students who previously would have done well at Ordinary Level*

*With the exception of one of two Section B questions, none of the questions really challenge/stretch the more able students.*

*By contrast, the easier Section A questions don't account for an adequate number of marks for very weak students to pass the exam.*

*Common paper is not a good practice*

*Wide range of abilities but weaker students don't get the opportunities they had before to achieve with ordinary level paper.*

*I think students who are below average will struggle with the questions from section B  
Less able students will fail science now as project work is gone*

*Open ended questions don't suit weak students*

*Less able students will fail science now as project work is gone*

*Open ended questions don't suit weak students*

*No choice on a paper is unfair. Too wordy for weak students.*

*Weak students still struggle with vague questions.*

*Below average students will struggle with a number of questions. Definitions which could help pass a student no longer feature heavily nor is their work in class projects helping them towards a pass mark.*

*I feel that students that would have completed the ordinary level exam paper will find many of the questions difficult and students that would have been higher level will not be challenged enough.*

## **11.2 Reading level of exam paper**

Many teachers commented on the level of reading used in the exam paper.

*Many students will struggle with the amount of reading required on the paper and unnecessarily complex language. A common level Science paper cannot effectively assess a very low ability and high ability student on the same paper. Weaker students will experience less success than with the previous OL standard paper.*

*The average or below average student will struggle with comprehending the questions I work in a very mixed ability school where some students have a very low reading age/ comprehension. This common level paper does not cater for the weaker child. Such students could achieve good grades by working on their lab book & project which was worth 35 % .*

*It assumes students have excellent English, no learning difficulties and have a very good background knowledge of scientific issues*

*Fill in the blank questions for a 16 year old student with choice of answers given is of no challenge to most learners. Again the only difficult part of the sample papers is the language and accessibility of questions/explanations.*

*I don't like the comprehension on the Science paper I feel it makes life very difficult for those students that have special needs and learning difficulties such as dyslexia. We should be examining Science not English. I also think this paper is more difficult to pass for the weaker students who do not have the understanding of Science.*

*Questions are very difficult at times & weaker students are going to leave out large chunks of the paper*

*Students with learning difficulties will struggle greatly with Section B, but with saying that they do struggle anyway! Also the more able students will find it difficult to get a distinction because of the style of the questions!*

*I think it allows for good differentiation of abilities. However I think there is too much reading required for below average students or students who struggle with literacy and the paper can look very intimidating.*

*The language used in the test and the amount of comprehension required will mean that the less able students will struggle to understand what is being asked if them.*

*I think that the below average will struggle with the wordy nature of the paper*

*Below average students may be discouraged by the more challenging questions. Some of the more challenging questions are ambiguous which may not suit the exceptional students.*

*Open nature of the questions can be confusing for below average student*

*My weaker students (formally ordinary level candidates) are unable to interpret the questions*

*The reading level is too high for weak or JCSP students. Many students are not at age 12 for reading but supported with a less wordy paper student could access the paper.*

*Language too difficult in latter half of paper for less able and too easy in section A*

### **11.3 Level of challenge for high ability students**

A common point made by teachers was that they felt the exam paper was not challenging enough for the higher ability students.

*I don't think it suits any student group, I feel it will leave the weaker students behind and will be too easy for the most part for the higher level students*

*I feel the exceptional students find the questions too easy. This may be frustrating to them*

*Common paper is not a good practice*

*The paper is not challenging enough for the exceptional students.*

*Too easy for exceptional - not challenging enough for that level.*

*Exceptional students needs not fully meet*

*There was a good mix of questions but nothing I felt was particularly challenging for an exceptional student.*

*I think the students who struggle with science may find the paper manageable and those whom are high achieving student, may find the exam paper is too easy.*

*Very good students are not being truly tested.*

*I think there are lots on paper at basic level, but differentiation for able and exceptional students is not done well*

*Until I see a marking scheme, it is difficult to see how the students that are above average or exceptional will perform. In recent years, we seem to be catering increasingly for the below average and average ability students and neglecting the needs of the above average and exceptional student.*

*I can't imagine the truly exceptional pupil being challenged by the sample paper. It is designed with the average and below average pupil in mind.*

*A lot of the exam is reading comprehension not science. Not challenging stronger students sufficiently.*

*Not enough challenge for highly motivated students, overall feeling of dumbing down, very primary school like*

*I know that my above average and exceptional students are frustrated and annoyed at the simplicity of the paper*

*I feel that it has been dumbed down a huge amount to accommodate the weaker students but I think the students above average and exceptional are not stimulated enough.*

*I think the students who are between average and exceptional will miss out. questions are either quite difficult or easy*

*My daughter in 6th class did the paper at home and got 36% without one science lesson in secondary school. We need to expect more form our students.*

*It is not suitable for the above average and exceptional students; it is too dumbed down for them*

*Exceptional students forgotten about.*

*We seem to be racing to the bottom all the time trying to get the very weak to pass but forget about the high achievers. We need to realise that not everyone in life achieves at everything.*

*It seems designed to give all students a rosette for participating yet little reward or indeed challenge for the mid level to aspiring future senior cycle science students.*

*Do not think it highlights major critical thinking. Worried the higher achievers will get bored.*

*The exceptional students are not being challenged enough as this is an inclusive paper. There are only a couple of questions where the exceptional students would shine over an average student.*

## **11.4 Students' understanding of the depth of knowledge required in answering the exam paper**

Some teachers commented that students may have difficulty knowing the depth to which they should answer questions.

*Weaker students will not understand the depth of knowledge that will be required in questions that are vague*

*The structure of questioning is strong but the open ended nature is challenging for many*

*Cannot test the higher ability pupils with the way the specification is set up. With vague learning outcomes, pupils from different schools will get completely different learning experiences which cannot be catered for in assessments. Clearer learning objectives with much more detail required.*

*With the new layout it's hard to know what exactly could be asked in the exam, this will make it hard for some students to answer questions with certain wording or looking at a topic from a different perspective than how it was done in their classroom*

*The best students are left guessing as to the detail/depth required on answers.*

*Higher end will give more than enough info - hard to know without seeing marking scheme*

*Very loose specification - doesn't differentiate for better students*

## **11.5 Positive voices**

Many teachers spoke very positively about the examination paper.

*All students needs met if paper designed to high standard for learning outcomes end exam*

*Room for everyone to achieve in this paper.*

*It does cater for all: there are a variety of easy to very challenging questions*

*The exam is accessible for all students. Whether literacy, numeracy or scientific literacy is the key outcome- this exam allows all students engage with the paper on some level.*

*I think the paper will suit all students. Some simpler questions for the "below average" students, lots for the average and above average and there is enough challenging questions for the exceptional.*

*I think it caters for all levels as it is up to the students ability the detail they Putnam into the question*

*It's a common paper. It needs to challenging to some students and easier for others. I like that students can answer the questions to their level of understanding and I think this is a much more realistic and practicable real world example of how knowledge works. I think streaming is inordinately unfair to students who struggle with science.*

*Common level should allow all to access. The questioning mode will enable this. I think the sample paper gave an indication that this will be done.*

*Should be something there for every ability now*

## 12. Number of Continuing Professional Development (CPD) sessions of science-specific JCT courses attended

In this section teachers were asked to indicate the number of continuing professional development (CPD) sessions of science-specific Junior Cycle for Teachers Support Service (JCT) courses attended.

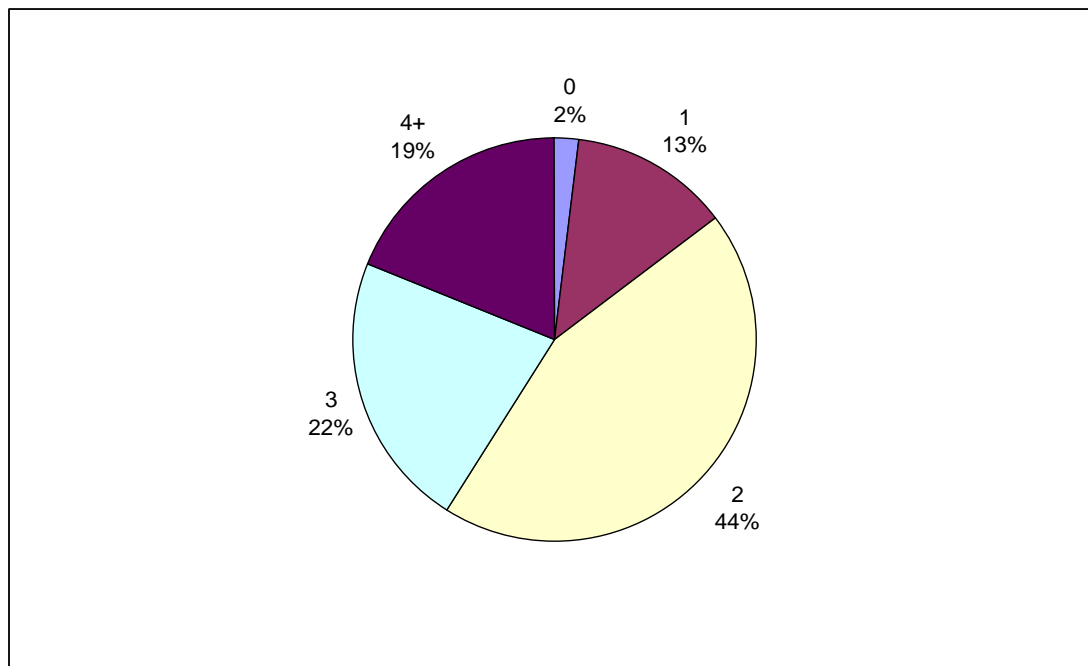


Figure 12



### **13. Science-specific JCT courses**

In this section teachers were asked to indicate on a five-point scale their level of satisfaction with the science-specific Junior Cycle for Teachers Support Service (JCT) courses which they attended.

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## 14. Number of CPD sessions of whole-school JCT courses attended

In this section teachers were asked to indicate the number of continuing professional development (CPD) sessions of whole-school Junior Cycle for Teachers Support Service (JCT) courses attended.

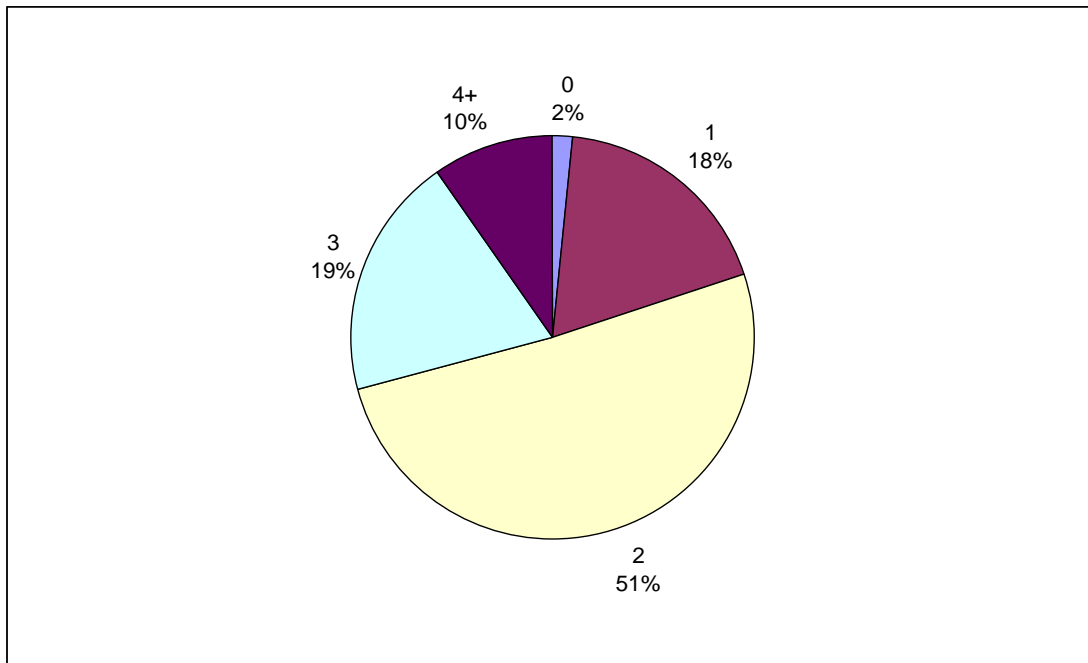


Figure 14

## **15. Whole-school JCT courses**

In this section teachers were asked to indicate on a five-point scale their level of satisfaction with the whole-school Junior Cycle for Teachers Support Service (JCT) courses which they attended.

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## 16. Application of Junior Cycle template of specification (syllabus) design to Leaving Certificate science subjects

In this section teachers were asked to indicate their level of satisfaction if the specifications at Leaving Certificate sciences were to be presented using the same template as that used at Junior Cycle science level.

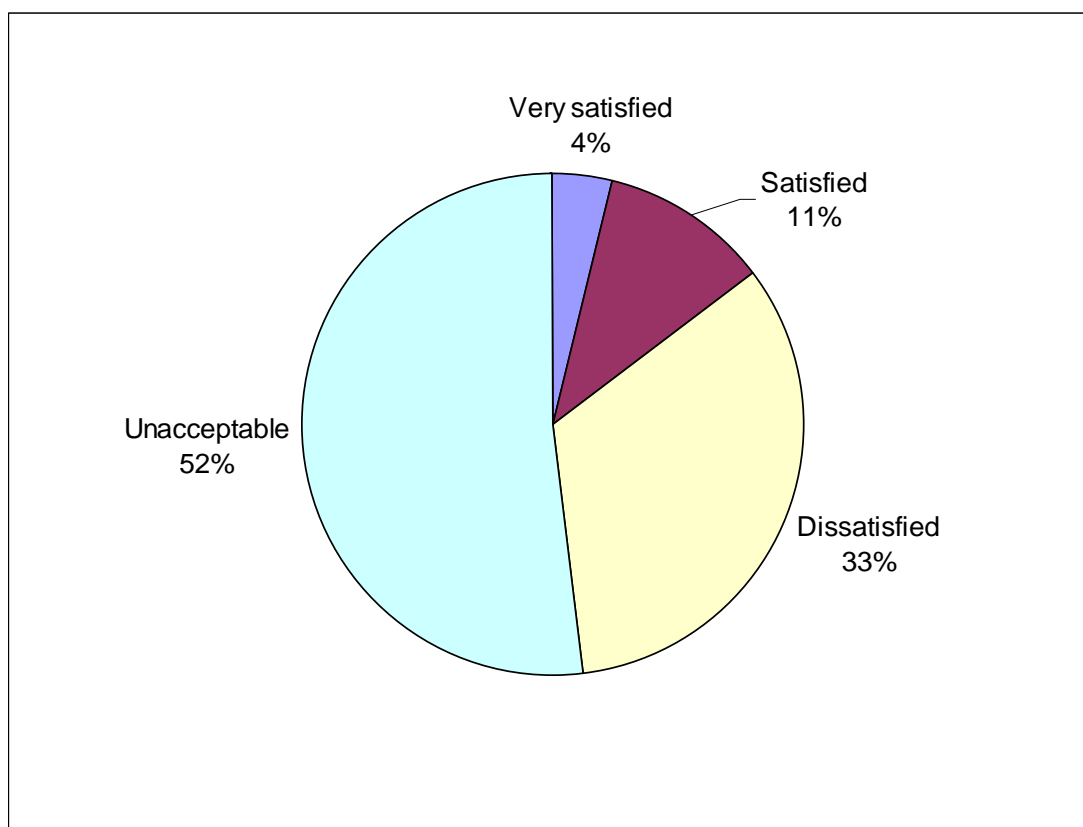


Figure 16.1

The following themes emerged from an analysis of the comments made by teachers.

### 16.1 Depth of Treatment

Many teachers commented on the vagueness of the learning outcomes and the need for depth of treatment to be supplied.

*The learning outcomes do not give enough information about depth of treatment and are open to interpretation by teachers and State Examinations Commission*

*The vagueness of the Junior Cycle needs to be clarified first. Teachers are still getting to grips with the new course. Leaving Cert reforms while necessary should not be rushed in until a full assessment of the success of Junior Cycle carried out.*

*The new JC specification is not a specification as it is not specific at all. I have worked in the UK and have seen what a specification should look like. This vague use of a list of learning outcomes only resulted in every school wasting many hours with pointless paperwork such as the unpacking fiasco.*

*Too much work trying to "unpack the learning outcomes". Just spell it out clearly and let us get on with teaching.*

*To be so unsure about the depth of content at senior cycle would be completely unacceptable.*

*The specification is too vague/ambiguous. The Hyland Report explains how inadequate this approach to writing curricula is.*

*The subject Science should be described by a detailed syllabus and several sample exam papers and not by a fuzzy specification and one sample exam paper*

*I actually would consider leaving teaching. Totally unacceptable for students to be sitting a common exam without a detailed syllabus so that every student in the country has the exact same opportunity. It should not be up to teachers to decide WHAT to teach, it is up to teachers to decide HOW best to teach it.*

*The Leaving Certificate specifications will need to be more specific and less open to interpretation.*

*As stated above , a poster is NOT a curriculum specification . Teachers MUST know precisely the depth of treatment required to give students every chance of achievement at LC. I refer to NBSS / PDST Biology inservices delivered and the paperwork and guides devised as a template for GOOD PRACTICE. Excellent.*

*Students need to know what is expected of them at Leaving Cert level especially if they want to go to college and need points. If the teachers are given the same type of learning outcomes as for the Junior Cycle they will not be sure so how then can the students do well.*

*Current JC specifications give no detail or guidelines on the dept of treatment required. The specifications are anything but specific.*

*What exactly is wrong with actually indicating the depth of treatment needed for each topic? The current JC specifications basically mean that different teachers can teach different topics to totally different levels with totally different time allocations. How can that be acceptable.*

*Pressure for kids to perform in getting points. Lots of expectations and not fair to be given half of info like in JC. Can understand jc is building skills etc but leaving cert needs to be explicit in what it expects*

*I think the new J Cycle is very poorly thought out and planned. Every teacher in the country is expected to unravel the learning outcomes and interpret what they mean and teach accordingly. Considering that we are trying to push STEM subjects,*



*replacing the practical assessment of 35% with 10%; and getting our most brilliant to sit the same paper as our very weakest students is ridiculous. There is no direction. This is the cheap way to teach science - at the cost to the students and the future.*

*My JC students have been used as guinea pigs to implement this new JC course I as a teacher would not be able to stand over the same at senior cycle. We did not get adequate training. A DEFINITE SYLLABUS IS REQUIRED FOR SENIOR CYCLE.*

*The Leaving Cert is an important terminal exam, to prepare my students for it, I would like to know specific learning outcomes and depth of treatment for different topics. Not knowing depth of treatment in junior cycle is frustrating*

*The Leaving Cert specifications are very well laid out and easy to understand. There is no interpretation with it. A lot of the JC specifications can be interpreted differently by different people and so many students are getting varied educational experiences in science. They may all meet the same learning outcomes but not in the same way, with some teachers probably doing better than others.*

*I don't know what is on the Junior Cycle course as the specification is so vague, I've no idea how I could cope if the LC Physics course was the same.*

*The specification is far too vague and open to interpretation*

*I teach Leaving Cert chemistry. It is already hugely difficult for some of my students. And that is having specific learning outcomes. It would be hugely unfair to teach unclear outcomes for such a difficult subject*

*Specification is too broad and leaves us guessing what depth needs to be covered. The Leaving certificate course is a very comprehensive course as it stands. It doesn't really need to be messed around with. The biggest stress of JC science teachers is the specification and not a syllabus like we have worked with previously.*

*Because of the stakes of the terminal exam. Since it is still all about the high-stakes exam, then it will be unfair on students and teachers to have broad learning objectives without lots of guidelines on what exactly students should know for the exam. I would have no problem with broad learning outcomes if there was adequate support documentation, as we see for example with the International Baccalaureate, where the syllabus document is supplemented by IB Biology guidelines which offer guidance on activities and expectations.*

*The current template (of the National Council for Curriculum and Assessment) for designing a new (or revised) curriculum is limited to a statement of topics and a list of learning outcomes. It is simply an outline or a framework for a possible syllabus. No further details are provided and no indication is given of depth of treatment of a topic or theme, nor are teachers' notes or an examination specification included in the syllabus document as was available in the past.*

*We need a more specific outline. We shouldn't have to guess whether plants are on the course for example.*

*Essential that there is a SYLLABUS THAT SPECIFIES DEPTH of cover for the topics.*

*The template being used at Junior Cycle level is simply dreadful. The specification consists simply of a list of learning outcome with no details of depth of treatment. In a recent article in the Irish Times on 26 February 2019, the teacher who wrote the article described Junior Cycle reform as resembling "an Ikea-style flatpack but with no accompanying instructions". I fully agree with this sentiment. At the JCT courses a lot of time was spent telling us how to "unpack the learning outcomes". It is not the job of the teacher to interpret the learning outcomes. It is not our job to try to read the minds of those who designed the specifications. It is the job of the NCCA and its committees to draw up syllabi of international standard as outlined in the Hyland Report. It is the duty of the NCCA to provide proper syllabi as we have at present in Leaving Certificate Biology, Chemistry and Physics. Leaving Certificate syllabi need to be properly designed and fit for purpose.*

*The specifications are open to too much individual interpretation. While I value the opportunity of including my own content and experiences, I want to know that I am covering the correct outcomes with my classes.*

*They are too vague and as a result my interpretation may not be the same as the Dept's. A proper syllabus is needed.*

*It specifies nothing. That's the irony.*

*It involves a lot of guess work and I am bombarded with so many initiatives that I am seriously considering retiring early. Just tell us what to teach and let us get on with it*

*I think the stakes are too high at Leaving Cert. There needs to be absolute clarity on what is required in order for students to be prepared. At Junior Cycle it is appropriate to have flexibility, to be able to meet the interests of a group, and to be less sure of what they will face in an exam. I think students would find the more skill bases learning outcomes which are less specific very difficult to work with for such a high stakes exam.*

*Need to be more specific with what students need to learn. Stop with the unpacking of learning outcomes. State exactly what students need to study.*

*No clear direction in specificity of curriculum would be very concerning for students looking to get high points in LC*

*Please ensure that the mistakes of the JC "vaguenesses" are not repeated*

*Too vague!! JC specification were never designed with a terminal exam in mind. Can't present the LC specifications in the same way if the exams are to be like the sample for JC we saw.*

*Learning outcomes need to be clearly defined and not so open to interpretation as the j.c is now. The scope of the depth should be prescribed to keep equity in the exam process for students.*

*The unpacking of learning outcomes is ridiculous. All school should have the same outcomes and with teachers coming up with the outcomes itself, there is a level of unfairness and lack of uniformity*

*NEED TO BE TOLD THE EXPECTED DEPTH OF TREATMENT . What we were given at Junior Cycle was a Syllabus, not Specifications. There is nothing specific about the specifications.*

*No one knows what's on and not on the syllabus. Everyone again has their own interpretation.*

*Higher stakes exam, so we need to know exactly what to teach*

*Too vague. There would be no homogeneity with the depth of treatment which would be unfair to students when the result of it makes such a big difference to the course they are eligible for. There needs to be clear guidelines of what is expected of them.*

*You need to have specific content identified to allow for consistency and fairness at a much higher stakes examination*

*Too much planning needed and (a) Not enough time (b). Not enough help (c). Open to different interpretations*

*The specification is open to widely differing interpretations; cannot have that situation at LC level.*

*There is no way this level of uncertainty could be used in senior cycle.*

*Completely ridiculous notion! The LC specification must have absolutely no vagueness. It must state exactly what the student needs to know as their future life (CAO) cannot be dependant on their teacher's interpreted unpacking of outcomes.*

*No depth of content! A specification SPECIFIES the depth of treatment, these specifications don't specify depth of treatment and don't fit with what a specification does internationally! Just look at the other international specifications!*

*Absolutely no to this idea. Students at senior cycle need a clear syllabus which outlines clearly what topics and depth they need.*

*The specifications at Junior science level severely lack clarity. The learning outcome are far to vague. Clarity is need. We spend most of our science department meeting trying to figure out what the learning outcomes actually mean.*

*Just not clear. I could be doing work in my class for a month that may not be examinable. No clarity on depth of treatment and everybody interprets differently. A disgrace. Whoever designed this template should consider their position.*

*For every class I am trying to guess what is required. It is constant guess work and every science teacher has a different slant on it. I wish that like in LC we could just be told what is required and then be given the time to go into something in more detail or discuss a current science topic as we would have the time.*

*It is far too vague. No detail is given, especially regarding which experiments should be carried out.*

*The time and work required for staff to 'unpack' the learning outcomes in order to plan is also substantial. This would be eliminated if a properly syllabus was provided.*

## **16.2 Suitability of template for high stakes examination**

Many teachers expressed concern at the potential problems caused at Leaving Certificate if the Junior Cycle science template for syllabus (specification) design were applied to the Leaving Certificate syllabi.

*A dumbing down of the subject would be a disaster, too much time spent on CBAs and SLAR meetings- achieving nothing!!*

*I feel that it will destroy the STEM subjects by reducing core knowledge and content. The IDA will struggle to entice companies into Ireland as our standards will have fallen.*

*No depth of treatment provided, will lead to complete lack of standardisation and quality of teaching & learning will plummet. Until NCCA are willing to give a proper syllabus with depth of learning provided - this specification approach will not meet the needs of students or teachers. It has already been demonstrated through Prof Aine Hyland's report that a proper syllabus is needed. Stop wasting our time with this ambiguous document ("specification" )*

*Enough damage has already been done at junior cycle level!!*

*The paper of the leaving cert and the content covered would need to be as challenging and ensure the syllabus is not subjective (as the JC syllabus), because all students need to have the same foundation of scientific knowledge going into college, particularly if they are doing a science based course.*

*I teach chemistry and I love it. My students also seem to really enjoy it. I ask them for feedback regularly. I'm concerned that the practical component will be reduced.*

*This would represent a dumbing down of the LC.*

*The specifications are far too broad and open to too many different interpretations. The courses that are highly regarded by international standards (e.g. the IB) have much more specific syllabuses so that the students are very clear about what they need to know. In order for a system to be fair and well regarded there needs to be a clear understanding of exactly what a student is expected to be able to do. The depth to which each topic needs to be taught has to be clear, otherwise it could leave some*

*students at a disadvantage depending on how their teacher interpreted each learning outcome. Changing the Leaving Cert to be like the Junior Cycle would have a hugely negative impact on how the standard of the Irish education system would be judged and would make the process much more unfair on the students. It would be a tragedy.*

*It would lead to pupils having surface level knowledge causing them to be ill prepared for university. It would be a DISASTER*

*Depth of knowledge has become too diluted.*

*By the end of Leaving Cert the student would have no knowledge in detail about anything.*

*The Leaving Cert as it stands is a level playing field for all students. It is the ONLY way that complete impartiality can be maintained. Following the JC model will devalue the exam. Many of my students study in Northern Ireland and beyond. UCAS offers/interviews are based on JC results. It is now close to impossible to obtain an A. Going down the same route with the LC will further disadvantage Irish students.*

*Students wouldn't be prepared for 3rd level*

*I believe that unpacking learning outcomes individually leaves massive room for variation and discrepancies between classrooms and schools*

*I would be concerned that there is too much ambiguity around what needs to be covered, and there would be potential for major gaps in the students' learning in terms of progressing to 3rd level.*

*Students need to have concrete understanding of scientific knowledge and concepts for entry to college courses. While I would welcome some structured form of continuous assessment, the current junior cycle model is FAR too vague and simplistic*

*J cert science has been messed up please don't destroy the L. cert*

*Our students would not have a deep enough understanding to study their subject at 3rd level*

*Vague learning outcomes will lead to further dumbing down and a decrease in the quality of the Irish education system that will have serious long term negative effects on the education system and economy.*

*Standards will be lowered at Leaving Cert making pupils poorly prepared for third level education.*

*The level is so dumbed down that if we do the same with our Leaving Cert then we will just move the knowledge gap to the leaving cert 3rd level transition phase.. unless we plan to dumb those down even more than we already have.*

*We are trying to prepare students for the world of work and college. New JCT specification does neither.*

*CBA s are open to outside help to students who have access to someone who can help them. Budget pressure from parents in terms of awarding and justifying descriptors. The "unpacking" of LO s is ridiculous workload on teachers and open to different interpretations by teachers of what needs to be covered and in what depth.*

*Not challenging enough. Too little content. No clear syllabus*

*The students are taking these courses for college also. Are we gonna dumb down third level too!????*

*Students' futures should not be down to interpretation of woolly vague specifications*

*Students need specific knowledge to prepare them for a science course in third level. Leaving content wide open to teacher choice is not a good idea.*

*I would be greatly concerned for the future pupils of my subject if the current Leaving Certificate were replaced with the current packaged template for a curriculum we have been provided with in science.*

*Complete lowering of standards*

*The level of content will have to be altered at senior level to fill the gap in the knowledge which students have lost*

*Totally unacceptable. They would not be prepared for college. Our pride of being one of the top countries in preparing students for science in 3rd level would be out the window.*

*Leaving Cert needs a much clearer syllabus*

*You need a syllabus to follow so the colleges will know what students have learnt and everything is clear what is being taught*

*We are watering down the course too much.*

*Too much is at stake for the students to play around with dealing with interpretations of material. The playing field needs to be above all level and fair for all.*

*Far too vague for such a high stakes exam.*

*Leaving teachers to design their own specification around a set of learning outcomes for a common level paper is too open to different opinions and therefore inconsistency across every school*

*LC content needs updating but not deleting*

*Students will not have the required knowledge for third level.*

*How will students hope at 3rd level if we dumb down the LCert*

*If they choose this option it will put a huge pressure on students as they won't know where the goalposts are. Results from LC determine university entrance and therefore the pressures are much greater. If there is classroom based assessments it will be very difficult for teachers to be fair and objective.*

*I would worry about the standard of science going forward to 3rd level colleges.*

*It would be bringing down the level of understanding at Leaving Cert level. Therefore leaving them at a disadvantage for college*

*They would never learn enough material to enable them to go to college. Too little learning on new course. I think we have gone from one extreme to the other. A little rote learning is very good for the brain. I fear a certain area of the brain won't be exercised.*

*We will now be using TY as a more academic year to bring student's understanding up to a higher level.*

*The new Junior Cycle has taken away vast amounts of knowledge and the abyss of knowledge lacking going into senior level is serious. To make changes will certainly affect students going into 3rd level.*

*JCT specifications were designed for school consideration and assessment. They were never designed to be examined by a state exam on completion and it was the inclusion of the exam that has caused the problem. These type of specifications simply don't work with a state exam and I don't see anyone calling to scrap the written Leaving Cert so these type of specifications plainly wouldn't work.*

*Having dumbed down the Junior cycle we now intend to dumb down the Leaving Cert also? We will end up destroying the Irish education system*

*I feel it's unacceptable for JC but that will not have an effect on 3rd level For LC it would be totally and utterly unacceptable.*

*It's ruining the standard of education in Ireland. We would no longer be well regarded on internationally. We should model ourselves on the best international systems.*

*They would know very little content at a very vague level and would not be able to cope with science courses at University level. We are being constantly told we have to share learning intentions with students but how can I do that when I don't know exactly what they need to know. How can they have a high level of science required for university with such a wishy washy foundation. Totally unacceptable. The only hope universities have of decent science students is if we undo the damage Junior Cycle has done ....*

*The vagueness and lack of guidelines would be a total disaster. The current syllabi and associated teacher guidelines provide a very useful and uniform approach to knowing what to cover and what can be asked. Grey areas would create total disorder.*

*Totally unacceptable. Unless we want to send our young adults into 3rd level and subsequently the world of work totally unprepared. If the leaving cert template is made to match the JC we will have less we'll prepared young adults entering into 3rd level. The problem is just pushed down the line.*

*Would not be one bit happy. it's all over the shop for the Junior Cycle. Leave the Leaving Cert alone*

*Too vague. Hard to know what is really examinable and neither NCCA nor JCT give us clarity.*

*Until such time as each school is given a lab technician and relevant IT resources and support, I feel that if a similar path was taken for the Leaving Cert, student outcomes would suffer due to insufficient resources being deployed.*

*The Leaving Cert needs to be more concrete to ensure students are set for University and that universities know what has been covered and the depth covered*

*I feel at present the LC Chemistry syllabus is generally good. I believe it provides a good all round foundation for life/ future chemistry careers. I would be extremely unhappy with the learning outcome approach with a lack of depth of treatment.*

*Extremely vague language is up for debate, it is unacceptable. Also differences between the English and Irish version of the specification (in the JCT learning outcomes poster, acceleration is mentioned in English but not in Irish)*

*The current "specification" is unacceptably vague and at CPD, our Facilitator explicitly said that they don't mind what subject matter is taught, as long as skills are acquired. This is quite obviously educational nonsense. The LC course is a gateway to 3rd level, and we will do our students no favours by failing to teach foundational concepts in the sciences.*

*They have no real scientific knowledge, and no real experience of proper learning*

*There is no standardisation and I find this unacceptable. The specifications are too vague, I as a teacher should not be responsible for essentially designing a curriculum that is going to be examined on a national level and ultimately determine whether someone can access third level education*

*Students would be unable to study in a science related field at third level if the leaving cert was to change to same template as Junior cycle.*

*It would be a destruction of the current excellent syllabi, a further dumbing down of the subjects and very hard to teach without clear learning outcomes.*



### **16.3 Student and teacher wellbeing due to stress**

There was a strong emphasis on the concern that vague syllabi at Leaving Certificate would have on the stress placed on students and teachers.

*Teachers are left to work out what's on the syllabus for themselves. The stress of this is frightening. A disaster if brought in at Leaving Cert.*

*Pressure on students would be unbearable if they had to content with 7 CBAs in 5th year, 7 CBAs in 6th year and also prepare for 7 written exams. Parents will challenge the awarded descriptors more when stakes are higher. Bad idea.*

*The new JC Science is a disaster. Students hate it and as teachers we are completely stressed with the lack of guidance. Science is a factual subject and students need to learn the basic facts before they can plan investigations etc.*

*I will retire early and go teach abroad, leaving one less physics teacher in the country. Students in LC would hate this. Having had 2 students come first in the country over the years, I know the top level students will have no interest in projects. Weaker students can't plan and process for projects and all we will be doing is adding stress to their lives.*

*The non defining of the junior cycle syllabus has led to increased stress for both pupils and teachers. The contents of the textbooks vary so much that it is impossible to know how best to advise students on learning. This level of uncertainty is detrimental to wellbeing. I would hate to put our leaving cert students through a similar process.*

*I support the basis principles underpinning the Junior Cycle but the manner in which it has been implemented at both school and national level has been very unsupportive of teacher and pupil wellbeing. Change is positive when managed properly.*

*I would leave teaching. I am confident that I have fully prepared students who want to do well on the LC but my JC students who work hard and hang on every word you teach... I'm still not confident that I have prepared them... very upsetting*

*Syllabus needed to direct- LOs to unpack is not acceptable especially given the variety of the courses and THE MAGNITUDE OF THE LC Exam. More structured approach needed especially given the amount of confrontation of teachers by parents nowadays. You only have to look at the 6th yr last year taking the SEC to court!!!! What if that was to happen in school setting against a teacher as a result of them not covering a topic in-depth despite LO being vague! TOTALLY NOT ACCEPTABLE*

*I honestly feel if the LC changed in the same manner as the new Junior cycle that it would be to the detriment of the Irish education system and standard of students presented to higher education. The students would be incapable of actually learning important pieces of information. The absolute vagueness of the learning outcomes would put a strain on teacher student relationships, where I wouldn't even have confidence in myself as a teacher that I would be pointing them in the right direction. How are the students to have faith and confidence in a facilitator who hasn't been facilitated by SEC/JCT/NCCA in the correct way themselves.*

*Weak educational format. No challenge- it would be a huge disservice to students who have such potential. It would increase their stress levels and anxiety as from school to third level they would not have the skills they possess at the moment. I would probably leave teaching if it was as bad as the junior cert.*

*I think the way the new junior cycle was bought in was disgraceful. Very little information, very little thought behind the assessments. Assessments that take up a lot of class time but have no real importance. A slow dribbling release of resources.*

*Unfair on students that their teachers are not sure what exactly they should be teaching them.*

*Stakes are too high for this level of vagueness. we would be doing our students a huge disservice.*

*The volume of work required to deliver the JC course with no real specification is huge. At Leaving Cert this would simply be unmanageable.*

*I would retire if this was the case. How would those students cope at 3rd level? As it is, I have asked to not teach JC Science again & focus on teaching Seniors.*

*Think they are unclear and open to different interpretations . Increasing teacher stress especially teachers who care about their students being fully prepared for the exam. But we aren't meant to teach towards an exam yet it's worth 90% in JC and 100% in LC!!*

*I couldn't face another 2/3 years of teaching the unknown. Please no!!!! Student anxiety might be an issue as it is unfortunately a high stakes exam.*

*While so much still rides on grades and points at Leaving certificate a specification that is as vague as the junior cycle one would leave me feeling very unconfident that I was preparing students adequately for the exam.*

*My greatest fear is that this would happen in this way to the L.C and ultimately continued "dumbing down" of the subject would win the day!*

*If it's going to be a high stakes exam the present format of junior cycle spec too vague making it too stressful. Stresses teachers result in stressed students*

*I feel this would be a complete disaster. The students would suffer hugely and so would the teachers.*

*Not every student will be exposed to information at the same depth and will not have the same experimental skills. It is unfair to then test students and award points based on this system. It would be unjust.*

*CBA's are putting undue pressure on students due to timing. When students have up to 10 CBA's, extra curricular activities will not be able to take place during school time. It is already difficult to organise basketball, football games etc.*

*I feel the learning outcomes of the current junior cycle science are well laid out, however I feel in general the specification is too vague and has required a lot of clarification so this would need to be addressed at leaving cert. The leaving cert is an integral part of deciding where (a lot) of students' futures lie and it is a time of stress for a majority of students so both teachers/students need to be certain of what is expected of them in a new specification.*

*Very important that if the LC follows the same template that adequate resources such as laboratory technicians and suitable equipment be given to schools.*

*It's too vague as to exactly what is to be covered and the depth to which it is covered. Therefore I might deem something only needs to be glanced at but then a long in-depth question comes up and I've failed my students.*

*Until I had my first science cluster day in early 2018 I felt 0 out of 10 confidence in my what I was supposed to be teaching. After the Cluster day I was 2 out of 10. I was in school for three weeks of mornings in June 2018 to get my head around the course and brought myself up to 4 out of 10. when the sample papers came out I was 5 out of 10 and there I stand until this June when I come in my own time to figure out what practical work they are supposed to be doing!!!! This is my biggest frustration with the course - all of the practical work that we used to do I'm no longer doing but I haven't replaced it with anything.*

*I feel I don't know what content is needed and in some cases could have done too much or too little. This is very unsettling. For example, do students need to know the chemical equation for photosynthesis or is the word equation sufficient? This is not clear from learning outcomes so do I cover this or not? - too much guess work to base a JC on, never mind a LC.*

*The level of anxiety experienced by Lc students would have detrimental effects to all.*

*It needs to be clear what has to be taught. Cannot afford the ambiguity or guess work at leaving cert level*

*With students' futures directly affected by their LC I could not work with the ambiguity of the learning outcomes system as it stands. It would cause extreme stress & anxiety for both students & teachers I believe. For example 'a range of separation techniques'.....how many? What if I do 4 but the exam paper asks about the 5th we didn't cover. It is too vague*

*Specification is too vague, I would not be confident in my ability to adequately prepare students for a final exam if the specification was the same for leaving certificate*

*The Leaving Certificate presents a high level of risk with the competitiveness of the CAO and university course places. The scope for teacher autonomy here is too risky, if a teacher/group of teachers interpreted the LO's incorrectly this could have drastic consequences for the students preparation for a high stakes terminal examination.*

*It's a total joke to expect teachers to go through a senior cycle change as well. Please learn from past mistakes. The senior cycle is playing with students college choices and careers. It is much more serious. Please do not make a mess of it as well*

*Unacceptable to teach a course without a syllabus. Having every department in every school "unpacking" LO's to varying standards with no oversight is not productive and a disservice to our students*

*More time is spent worrying whether the learning outcomes have been fully covered and to an appropriate depth. Even when people from the JCT are asked their answers vary. It feels unnecessary that we are all going through the same process of unpacking the learning outcomes, especially when they seem to want us to come to same conclusion.*

*It also feels like the quality of teaching must be far more varied now as we don't even know the minimum requirement, and the methods we use are based on our previous experience which may be limited in certain areas.*

*This is a vague, one level, disaster. I fear for the uptake of chemistry and physics at Leaving certificate level.*

*We need to know exactly what to teach. This becomes vital given the significance of the leaving cert exam to our students futures.*

*Project Maths was needlessly stressful and traumatic on students and teachers. Continuing with the same process and expecting a different outcome is senseless. The ambiguity and lack of clarity in the delivery of the new Junior cert science curriculum would be questionable if it's transferred to the Leaving Certificate given the process has been completed several times now with the same difficulties and yet to repeat the process without genuine and substantial consultation with teachers and students about the process of reform.*

*Specification is far too vague, "unpacking" very stressful, time consuming and open to interpretation...*

*It is our responsibility to prepare students for college which requires students getting points. I strongly believe in active learning methodologies but with a specific syllabus that we as teachers can understand what to teach and not have to guess what we might have to teach*

*It would be very unfair on the first group of students (guinea pigs) considering the implication in terms of points. Also for teachers teaching the course, it would be very stressful not knowing if we were covering enough material in every topic.*

*It's difficult enough having to teaching leaving cert without having to unpack specification on top of it ( pure guess work)*

*They are too vague. Leaving Certificate exams determine what course a person gets and their career path in many cases. It would be absolutely unacceptable to have the same degree of ambiguity at LC level, it would be completely unfair to the students*

*and the teachers. They are far too important. LC Biology specifications but be exact in every term that students are expected to know*

*Too vague, a way too much work and pressure on teacher to 'unpack' very vague outcomes, these have to be more defined.*

*Can't use leaving certs as guinea pigs for a new course while we as teachers interpret learning outcomes. And we all interpret them differently. It's their LC and college courses at stake!*

*Too much stress and uncertainty. Feel inadequate when we are guessing what we need to actually make sure our students know. Unfair to hard working students.*

*There are no specifications as to what exactly students are supposed to know - or what we are supposed to teach. It's mad Crazy!*

*If the LC goes down this way then we may all give up.*

*I would be horrified!! I need a syllabus that is understandable and written in plain straightforward English which clearly states what the students precisely need to know (just like the current syllabus) and what experiments they need to have done. I also do not want to see any reduction in contact time with classes as I struggle as it is to cover the course in the time allowed.*

## **16.4 Satisfied and very satisfied comments**

A total of 15% of teachers expressed the opinion that they satisfied or very satisfied if the specifications at Leaving Certificate sciences were to be presented using the same template as that used at Junior Cycle science level. Of the 15% of teachers in this category, 11% chose satisfied and 4% chose very satisfied.

Some comments made by teachers who chose the satisfied or very satisfied categories are summarised below.

*It's a good template.*

*Idea is great but it needs time to filter through. We need more class contact time and less well-being because ironically the shortened class contact time is affecting the well being of students and staff. They need more time for projects etc .*

*My LC class would benefit from developing more skills and understanding not just facts*

*I like it ... it's simple and if your familiar with your material then it's jot a problem .... it will or could be a problem for young teachers*

*It would be a further dumbing down of our educational system which currently doing really well in PISA scores and in OECD rankings despite chronic underfunding.*

*The physics and chemistry syllabi (which I have taught) have excellent and appropriate detail in their depth of treatment. Any move away from leaving learning outcomes to being open to interpretation would be damaging to the high standards that we correctly maintain for senior sciences. The fact that there is an ordinary level and higher level paper also allows for access to the curriculum to learners of different abilities.*

*Layout is clear. Easy to follow. Allows for flexible teaching. Outcomes are broad, meaning teachers can then make focused learning intentions. Ideal layout for the teachers in our school.*

*There should be some sort of continuation, I would like it but you are leaving it open to interpretation again by teachers. Also you are assuming that all teachers will be suitably knowledgeable in their subject areas.*

*I like that the course is not so specific leading to teachers having to teach to the test rather than giving students a chance to investigate areas in which they have an interest. There needs to be some form of continuous assessment rather than students having just one chance to perform. That's what happens in real life!*

*Yes, but more information would be needed*

*Need to embrace the fact that rote learning does nothing but garner point. Many students leave second level with good results but no core understanding of science. Teach to test driven leaving certificate is soul destroying*

*New senior cycle will have to promote key skills but there is a fear of the standard dropping*

*I would love to see more student led experimentation at Leaving Cert but facilities we need serious upgrading for that to happen*

*More guidance would be required to assure standards were the same country wide. Depth of treatment should be explicit or else you are moving against the idea that student deserve success criteria. If there is not a clear layout detailing what is needed and at what depth then students will ultimately struggle. Looking across Europe and the UK student generally have clear criteria to satisfy.*

*More training needed before course begins.*

*I don't think that all learning outcomes should be unpacked by teachers. Too time consuming*

*The Leaving Cert Biology course presently only wants regurgitation. It gives no percent for all of the lab skills the students have learnt. It is the opposite of J.Cycle. I would like to see an opportunity for students to do investigative research but still expect learning of key concepts and language to be examined.*

*Template is fine but if the dept expect us to do active methodologies they need to hugely reduce length of courses. CBA TYPE projects need to go towards a*

*percentage of exam with external correction at Leaving Cert level. Teachers should not correct their own students work at LC level. Too much bias and too important for students .*

*We are on the road so we may as well keep moving forward. With what level of knowledge being imparted to the student is the big question. Are our exceptional students ever going to become ignited with a course like this? Time will tell. I have 2 past pupils working in CERN will that happen in the future with the road we are on?*

*I'd be fine with that. Initially when we started unpacking it looked like a nightmare, but you can see the links now. It's actually fine but I'd worry about leaving it to LC teachers to decide on the extent to the content etc. I suppose it depends on what comes out of the subject review.*

*Really don't have a choice, the new ag science specification is similar to jc..attended it this week.*

*Satisfied to a point. Cluster days are great where whole schools close down for training, but we need more of them before starting the course and units of work cannot be formatted as they are in JC.*

*A lot more support is needed for teachers in producing plans based on the new specifications, it's unfair to expect teachers to put more plans together, not enough time is available to do all this!!*

*Idea is great but it needs time to filter through. We need more class contact time and less well-being because ironically the shortened class contact time is affecting the well being of students and staff. They need more time for projects etc .*

## 17. Membership of ISTA

In this section teachers were asked to indicate whether or not they were members of the ISTA. If they were members, they were asked to indicate the number of years for which they have been members and how the ISTA could further cater for their needs.

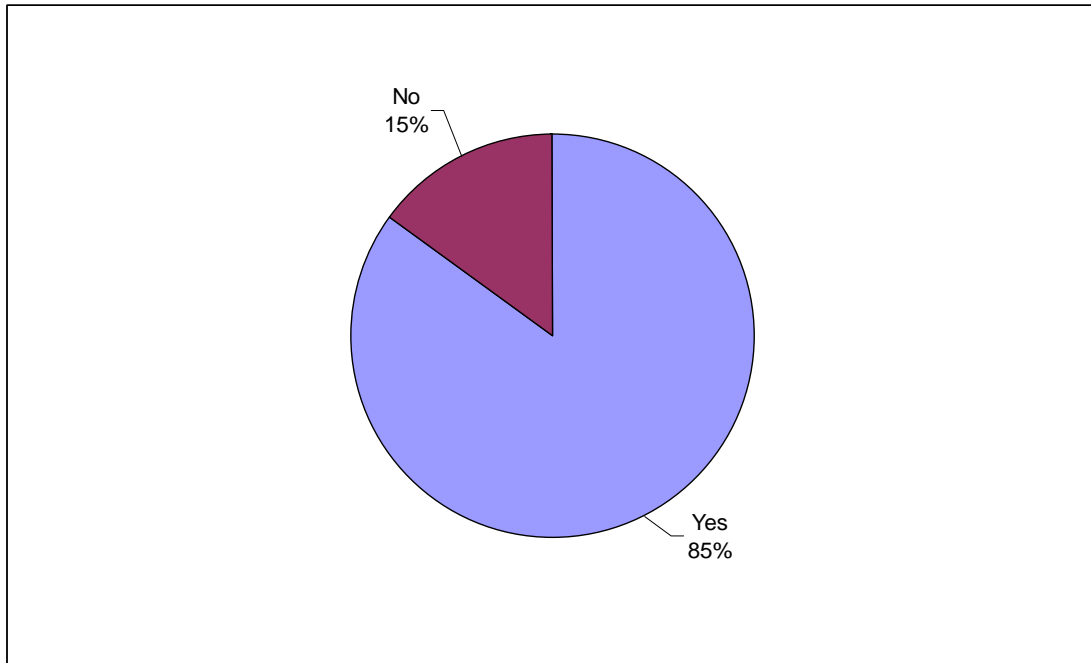


Figure 17.1

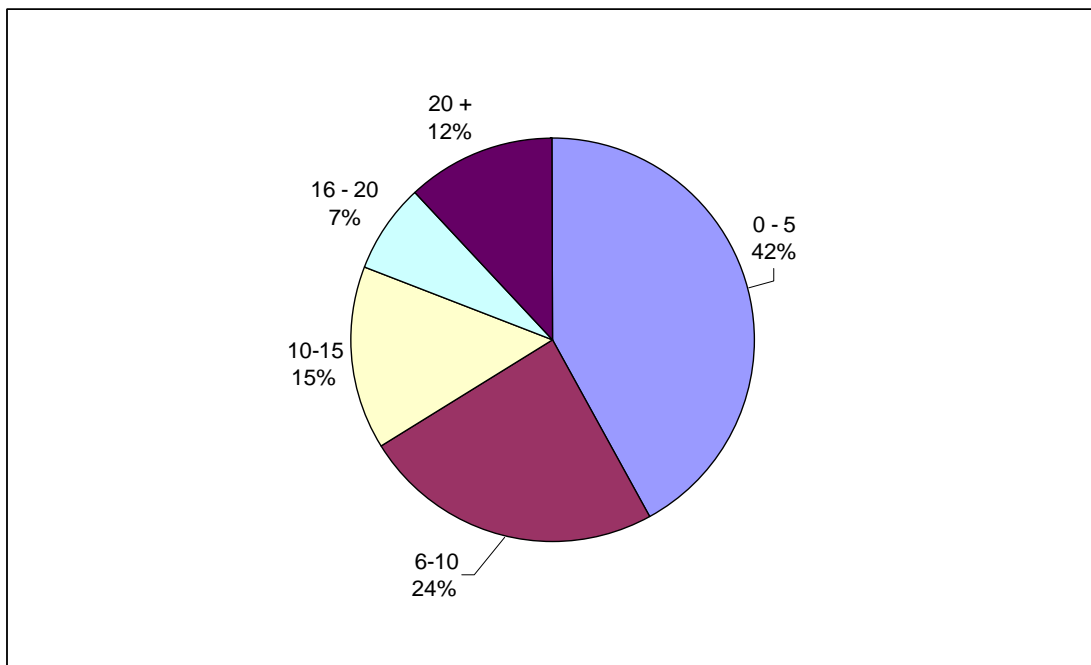


Figure 17.2



## 17.1 Provision of CPD

Below are representative comments of the teachers relating to CPD.

*Continue providing CPD on pedagogy and pedagogical content knowledge as well as making the case for maintaining high standards to the relevant bodies (NCCA).*

*More CPD sessions relating to specific learning outcomes.*

*More CPD especially in relation to CBAs.*

*More CPD days focusing on JC topics and teaching methodologies.*

*Continue to offer course related sessions at junior cycle and leaving cert.*

*Additional CPD for this new specification*

*The JCT provided good resources at the recent CPD Cluster Day. The ISTA has, in my opinion, concentrated too much on providing subject detail in recent CPD events. I understand that this facilitates the few who want to understand more deeply, but I would like to see more emphasis on teaching at the level of the students and resource provision for this purpose.*

*Good CPD but I would love more – not sure it's the remit of the ISTA but the more the better. Working on West Mayo, CPD is not always accessible.*

*More junior cycle science CPD, especially helpful ones on earth and space*

*More CPD on new course. Provide resources.*

*Encourage local CPD and much more of it.*

*Doing a great job! More CPD opportunities would be good.*

*CPD in relation to Learning Outcomes.*

*Put out a general call for suggestions on inservice that members might feel they need. Put out a general appeal to members for an expression of interest in giving a talk/presentation on a topic of their choice, or from a selection of the topics generated by the call I suggested above.*

*I have felt the attitude towards the current changes in the curriculum have been very negative and I would appreciate attending meetings where I am not left feeling foolish for embracing the change and seeing the positive. I will be longer teaching the new specification than I will have taught the old and I have appreciated the JCT CPD as there's an attitude of newness and excitement whereas at some ISTA meetings in regards to the new specification have focused on how to adapt the old to the new, which as a newer teacher is not as helpful.*

## 17.2 Assistance with unpacking Learning Outcomes

Below are representative comments of the teachers relating to Learning Outcomes.

*More help with 'unpacking' learning outcomes. Confusion doesn't even describe it.*

*Unpacking the LOs can be time consuming and a lot of teachers are anxious that they are not doing enough or even doing it right.*

*My needs right now consist mainly of acquiring a bank of quick and accessible resources for each of the Learning Outcomes in Junior Cycle Science. I have however spent a significant amount of time developing resources and am now ready to receive some! I agree with the reduction of emphasis on the use of the textbook in classrooms.*

*With particular reference to the new JCT Science specifications, perhaps a group of ISTA teachers might collaborate and unpack each of the learning outcomes so that a consensus could be achieved on the depth of treatment. These could be used as a template for schools to alter, based on their own needs. Similarly, additional teaching resources for JCT could be provided by the ISTA.*

*Also, specific workshops on specific learning outcomes to tease out what they actually mean and share resources for designing practical activities. Guidance on development of workable schemes of work.*

*Help us know what exactly they want with their vague learning outcomes.*

*Telling a science teacher to teach force for example is like telling a maths teacher to teach Algebra. What to include....no one knows!*

*Get the science learning outcomes unpacked!! Thank you!!*

*Help us unpack learning outcomes and facilitate more collaboration in teaching methodologies for each topic. ISTA has been my lifeline as a science teacher.*

*Unpack learning outcomes and help with planning as teachers seem to be completely lost.*

*Help with developing subject plan/ unpacking learning outcomes. We are a small dept (3 at Junior Cycle) and it is proving very time consuming.*

*Do sessions on how to deliver each of the Learning Outcomes and what experiments to do to best prepare students. Perhaps do these sessions in schools maybe a couple of schools could come together for a day or two.*

*Have collaborative group sessions to help 'unpacking' of units etc. We're all working on our own when we could be of so much assistance to one another. The only assistance I have is from a sharing science group – nothing to do with ISTA or JCT.*

### **17.3 Lobbying (NCCA, DES, JCT)**

Below are representative comments of the teachers relating to lobbying state agencies.

*Lobby for better clarification of the specification from the NCCA/DES and other bodies.*

*More pressure on NCCA/DES/JCT to revise this poor 'specification' and lobby for more class contact time and resources.*

*Advocating for clear, unambiguous, detailed specifications!*

*Lobby HARD for a return to the old syllabus style, where substance was more important than style, where the message took precedence over the medium, where KNOWLEDGE was a valued commodity.*

*Lobby the DES for a decent syllabus in science*

*Please continue to represent us and lobby to get more clarity on what we are doing at Junior Cycle and stop the same mistakes being made at senior cycle.*

*Continue providing CPD on pedagogy and pedagogical content knowledge as well as making the case for maintaining high standards to the relevant bodies (NCCA)*

*I encourage the ISTA to keep up the pressure on the NCCA and the Department of Education and Skills to ensure that the problems encountered with the Junior Cycle curriculum are not repeated at Leaving Certificate level.*

*Going public with the frustrations of Science teachers with NCCA's current lack of attention to providing a proper Syllabus. Providing more information to members on efforts & progress to date on negotiations with NCCA.*

*Represent these concerns to JCT and the NCCA.*

### **17.4 ISTA local meetings**

Below are representative comments of the teachers relating to the ISTA and ISTA membership.

*The ISTA provides courses that have given me a great insights into other ways and ideas for science. Very happy that I am a member!*

*Maybe more mini meet ups at local level but very happy with the association overall. A lot of hard work evident in the running of the ISTA.*

*Pedagogical content knowledge among teachers varies incredibly widely. The ISTA could also work with 3rd level teacher training institutions to further develop the training of teachers.*

*They (ISTA) don't cater for me at all. All the talks are in Dublin and a long distance away.*

*ISTA does good work, but top level appears too idealistic in its thinking.*

*More opportunities to meet other members.*

*More teacher outreach. Association can feel almost cliquey, for the more experienced teachers. Would love support evenings and maybe welcome evenings for newer teachers could be organised. More incentive to get involved in the association, without feeling like you are an interloper.*

*I need to rejoin. I was a member but forgot to rejoin.*

*Communication... even when membership lapses.... you guys just cut us off at the legs when we don't pay up..... bit short sighted.*

*Find out why lots of science teachers aren't members?*

*Provision of a forum like the sharing science forum?*

*Reduce the price of membership. Run more high quality CPD events.*

*What does my membership cover exactly?*

*Make paying up to being a member easier. I was a member for years and once membership changed to on line I have been unable to stay a member as it will not accept my membership*

## **17.5 Earth and Space & related CPD**

Below are representative comments of the teachers relating to Earth and Space.

*Training, particularly for Earth and Space science.*

*More CPD days focusing on JC topics and teaching methodologies, Sharing lesson ideas for new topics like earth and space*

*More junior cycle science CPD, especially helpful ones on earth and space*

*Earth science made easy and maybe some approaches to deliver energy topic in physics.*

*More resources based around Earth and Space, student friendly posters-digital or paper copy.*

*Help with earth science and designing a science teaching plan linked to learning outcomes etc.*

*Perhaps some Earth and Space courses that are actually based on the learning involved in the Learning Outcomes rather than being pitched above teachers heads.*

*Do more workshops of the physics / earth and space side of new JC - these workshops should give teachers ideas for teaching these topics.*

*They do a great job. Some more inservice on Earth and Space content would be great, with a facilitator that can make it tangible and accessible for all. Sometimes the demonstrations that the facilitators go through are lovely and engaging but I still don't come away with a deeper understanding of the content.*

*Put on decent courses. That space one still has me irritated by just how bad it was.*

*The ISTA has, in my opinion, concentrated too much on providing subject detail in recent CPD events. I understand that **this facilitates the few who want to understand more deeply**, but I would like to see more emphasis on teaching at the level of the students and resource provision for this purpose. Also more discussion with others on how they approach planning would be helpful.*

*I'd love more CPD on earth and space. I know Rory Geoghegan works with the ISTA to provide these and I went to one before which was excellent! So more of those please!!*

*I liked the space presentations you facilitated, not sure what else.*

## **17.6 Support at Leaving Certificate level**

Below are representative comments of the teachers relating to the Leaving Certificate.

*Junior Cycle reform and to highlight the struggle that I am having in teaching the new specification. The Junior Cycle reform has been extremely badly handled and our student will really suffer as they will not be prepared for Leaving Certificate at all. I encourage the ISTA to keep up the pressure on the NCCA and the Department of Education and Skills to ensure that the problems encountered with the Junior Cycle curriculum are not repeated at Leaving Certificate level.*

*This questionnaire was great; it allowed me to vent my frustration at teaching this nonsense and the prospect of trying to teach L.Cert students that have done this course for three years frightens me!*

*Please do not let leaving cert follow the same trend as JC, students will not be prepared for third level.*

*Try to ensure that teachers are key stakeholders in any change to LC science courses.*

*Better supports for teaching new JC. Stronger opposition against the introduction on a new LC syllabus, unless it is of a properly high standard.*

*Do not allow the LC to become the farce the JC now is. Rescue and restore second level science to what science education should be.*

## 17.7 Sharing resources

Below are representative comments of the teachers relating to resources and sharing.

*A collaboration platform for teachers to share resources, ideas etc.*

*Provide a resource sharing facility.*

*Facilitate sharing of good practice, e.g. teacher meets.*

*Perhaps give teachers opportunity to work on resources in groups/ at branch level. Then share these resources between branches. Otherwise add good resources to website. We all have tried certain things that work and wouldn't mind sharing.*

*Can you please organise teach meets or sharing resource meetings between teachers, so we can start sharing stuff?*

*Facilitating the sharing of units of learning and schemes of work so that every teacher in the country is not duplicating the same work.*

*Share planning among teachers - when resources are demonstrated at CPD events. Please have a 'one for everybody in the audience' at the end of it. I have had to come home from these days and re do these activities from photos I take.*

*More resources, slower introduction of these courses. Get more opinions on topics to cut out of courses beforehand.*

*As teaching comes under more scrutiny there is no help resources regarding lab layout, preparations, health and safety etc. which need to be formally catered for.*

*A collaboration platform for teachers to share resources, ideas etc.*

*More meetings on specific areas of spec. Resources shared for topics.*

*The support offered to the Junior Cert Coursework B in the past was invaluable. Any support of a similar nature that keeps science teachers connected and provides resources to keep the classroom an interesting learning environment. Resources & information on the use of technology in the science classroom.*

*Prepare workshops actually teaching material to teachers and providing resources and ideas.*

*Already putting on some great evening courses but we probably need more - and more resources like powerpoints etc.*

## 18. Additional comments

In this section teachers were invited to make any additional comments.

### 18.1 Stress of "unpacking" Learning Outcomes

Below are representative comments of the teachers relating to unpacking learning outcomes.

*I am in support of the CBAs, I have really enjoyed carrying them out and feel they will be of benefit to students in the future. I am not happy with the specification and the fact that every teacher is expected to 'unpack' the learning outcome with little or no knowledge as to if what they are covering is sufficient*

*I feel there is a strong suggestion teachers do not use a textbook. If this is the case we need more clarity on unpacking of the learning outcomes. It's silly that every teacher in the country is effectively doing the same thing but none of us know if we're correct or not*

*Learning outcomes should be unpacked and presented to teachers in a booklet. Teachers can amend these to suit their classes but having a basic layout would be best practice.*

*Re Junior Cycle - why are they obsessed with individual teachers 'unpacking' the learning outcomes and looking up definitions of verbs - I do not see how this is a productive use of a teachers' time.*

*Specifications are NOT a syllabus. Stress levels among teachers are through the roof trying to 'unpack' the learning outcomes. Please give us back a syllabus*

*The learning objectives should have been all unpacked for us so we knew what we were supposed to teach. We are being told how to teach but not what to teach. It should be the other way around*

*The notion of every school unpacking these outcomes independently is crazy, not enough guidance on what needs to be covered and to what level.*

*Unpacking the learning outcomes is a joke. Surely it's their job to be specific about what students should be learning, I feel like it's a guessing game and hope I'm hitting all the points the students should be aware of.*

*I feel that the specifications were set with the intention of the teacher setting his or her own exam at end. It is crazy that teachers need to pack learning outcomes. Decide what experiments to cover. With only 3 40 minute class periods in first year, it is hard to cover all including the cba's. The course needs to be shortened more or get rid of the cba 2 in 3rd year.*

*The lack of a logic-orientated learning outcome as a means of critical thinking is ominous in its omission.*

*I think the JCT and curriculum online should have created a resource activity and assessment for each learning outcome on how they saw the course being taught instead of every science teacher in the country trying to reinvent the wheel.*

## **18.2 Lack of clarity (and more "unpacking")**

Below are representative comments of the teachers relating to lack of clarity.

*... The old course may not have been perfect but at least it was clear what was on the course & if I didn't complete that, that was on me. Now I don't know what I'm doing, have virtually no support. The cluster days aren't helpful because the poor people giving them are being bombarded with questions they can't fully answer & clearly don't want to say anything to mislead so the day is filled with vague answers & no real guidance. Teachers are demoralised.*

*We need the LOs to be 'unpacked' for us and course content to be more specific... even within our science dept in school we have different interpretations and approaches to same topics - we are all in such a panic ALL of the time*

*I want to do a good job in my classroom and for my students. The way in which the new course has been introduced and the vagueness of the specification is very frustrating. We are all unsure of the depth of knowledge to cover and fear that our students will suffer.*

*I love teaching, I love science and up until now I never questioned my career choice. The new junior cycle has left me feeling unable to answer my students and their parents when they ask me basic questions about the new cycle and its content. How do you explain that what was a 65% written paper is now 90% under the new continuous assessment junior cycle and that they do two CBA's that in themselves are worth nothing but an assessment task which reads more like an English paper gets them a mere 10%. Who came up with this ridiculous system in the name of science.*

*The new JC science needs to address the lack of practical work and become clearer in the outcomes it wishes us to teach.*

*If additional hours were allocated to science teachers to teach this course it would allow teachers to teach the specification in the way it is planned to be taught with activities and students at the centre of their lead. Unfortunately with time constraints this is currently not possible.*

*In conclusion:*

- more clarity is needed on what should be covered for each topic*
- more CPD for teachers*
- outline of what experiments need to be covered*
- option questions in section B of exam paper*
- additional hours allocated to science teachers to teach the course*
- review of the content in the Course- does it reflect what students need to know for leaving cert?*

*I'm worried about Physics to a grave level. We don't have the teachers coming through and we don't have a subject to teach at JC level as the specification is so bad. We need clarity.*



*For a fair syllabus the depth of treatment must be clear and unambiguous.*

*Syllabus too vague. Need to know the depth of treatment for each topic.*

## **18.3 Concerns about preparing students for Leaving Certificate**

Below are representative comments of the teachers relating to the Leaving Certificate.

*I am new to science teaching. I come from industry and parenting perspective so I see this change in teaching science as a real positive in terms of lesson planning and student engagement. But it's still unclear as to how much fundamental science students will actually absorb.*

*Please let us not let the Leaving Cert. go the way of the new JC. Can we not get a HL and OL back at Junior Cycle? It wouldn't mean reinventing the new JC completely, just tweaking it. Bring back a HL and OL and whatever changes are made at Leaving Cert level please let's not drop the standard of the exam. We have a great reputation in Science and Technology and a well prepared well educated young workforce. Changing LC to match JC could begin to erode all of that.*

*...Also, 200 hours is not enough to adequately cover the course and prepare students for the jump to Leaving Certificate science.*

*The idea of the new Junior Cycle is great it is just a pity that it will make them less ready for the Leaving Certificate as it stands also it is a pity that their hard work is not really rewarded. With 10 CBA's in the future years students will feel pressurised become more anxious or throw the hat at it all together.*

*My main issue with the Specifications is their vagueness. I seem to be spending a lot of time guessing what is required. For example at the moment we are doing electricity, do I make sure that they set up circuits with bulbs in series, bulbs in parallel, with a resistor, with an LDR, LED?!? I am frustrated in that I don't know. And it is the same for every single topic.*

*We have no standardisation in specification content or I fear grading CBA's using the Features of Quality.*

*I have always tried to be the best teacher I can be but the vagueness of the new course in terms of what I teach, or facilitate the students in learning, makes this very difficult. I do not feel I have prepared my students adequately for a 3rd year exam.....for the first time in 20+ years!.*

*If this is the way forward for leaving cert science you will see a massive drop in uptake I feel. Hope this new cert science is changed as soon as possible, before it is too late.*

*I despair. Don't get me wrong. My first year students love the course, great buzz. I am having them reflect on their learning and work on planning with them to take*

*ownership for improving their knowledge gap. However, with a lot of content now gone it's going to be a chore to prepare them at LC level.*

*I really enjoy teaching the new course but I fear students will struggle when they come to LC Science.*

*Worried about the total dumbing down of Science and unpacking by teachers. A lot of biology teachers are not very confident in chemistry and physics so they will do minimum in these areas so fewer students will take chemistry and physics at leaving cert. hence fewer girls in particular will take Phy and Chemistry in college.*

*Going forward I fear for SC science. If Senior Cycle goes down the route of JC we are in trouble.*

## **18.4 CBAs and Assessment**

Below are representative comments of the teachers relating to Classroom Based Assessments.

*Above I mentioned how valuable the CBAs were. I want to add that I thought the assessment task was a complete joke. It did not reflect the work that students put into their CBAs.*

*The CBAs are open for outside help from parents and are causing a major problem in schools in relation to computer room access. The Assessment Task hardly evaluated any of the students work and the stimulus material was of no help to the students. Other subjects have a reflection sheet that the students complete ahead of time and have the answers with them during the AT. It is unfair that science students do not have the same opportunity.*

*I was very frustrated with the CBA2 in that students could copy and paste their work wholesale from one website and that there was very little that we could do about it. I found it difficult to monitor it and found it took up too much time.*

*We have lost at least 6 weeks with CBA's over the last 2 yrs yet we are expected to cover a much broader range of specifications and prepare students for a written exam which still accounts for 90% of their Junior Cert Science.*

*CBAs are great for the kids as an exercise /activity but I feel under pressure marking them for their JC Profile of Achievement, especially as many of our students and parents would have high expectations of themselves (and their teachers). It is also difficult to entirely 'park' what you know about a student, their abilities, aptitude and application, when assessing their work.*

*Overall I think the new specifications are beneficial to students. I think that better planning before implementation and more CPD aimed at the CBAs would be beneficial in terms of increasing teacher buy-in.*

*In terms of the CBAs one of the biggest problems is the students' lack of ICT equipment and skills. Many students do not have the basic ICT skills to use simple*

*software like word, powerpoint and excel. Nor do they have appropriate equipment to use it on. Many households no longer have a PC as mobile phones are used instead. Not ideal for research.*

*We need to get away from project based assessment like the CBA2s. There should be more emphasis on a student knowing basic and underlying concepts in Science and less on a wishy washy approach which alienates the children who are really interested in Science. You cannot problem solve until you have basic foundation knowledge in Science and Maths. Problem solving should be left to students doing their final year at 3rd Level not during the erratic teenage years.*

*Assessment task needs to go. Students gained zero benefit from it and the stimulus booklet was a waste of time as it confused the students more. The questions on it were hard to understand and it did not showcase how well they would have done in the SSI.*

*I think teachers need to get together and come up with an action plan. I feel like the unions misrepresented us with false information when we voted for external assessment. I would like to see the SSI and EEI worth more marks, instead of 10% Assessment Task. Without this, I don't think it is beneficial, but that's what we voted for. I think a new strategy on assessment, in conjunction with the JCT, NCCA and SEC, is needed.*

*Students don't even have regard for the profile of achievement. My own daughter looked at hers and commented that she had written the majority of it herself.. Paper never refused ink.*

*I think it is very poor that our subject association has allowed a practical based subject to be reduced from 35% to 10 when other practical subjects have retained and even increased the marked for such. It is very disappointing and does not give a great need to complete experiments in class. Learning off will be back in again with little hands on activity. Inquiry based learning which was key to the old syllabus has been checked out the window unfortunately.*

## **18.5 NCCA, DES, JCT, SEC**

Below are representative comments of the teachers relating to NCCA, DES, JCT, SEC.

*SEC, Inspectorate, NCCA and JCT need to work together to deliver a comprehensive syllabus to all teachers in a timeframe that is manageable. Deliver grants to update labs and ICT so teachers can do their job properly. The lack of reward to our students for their hard work is not acceptable.*

*Please make the nonsense that is coming from NCCA/JCT/SEC etc stop. Obviously courses and approaches need to be changed from time to time. Starting point should be: we have a good system; how can we improve it, not start from scratch each time. There is no perfect system - no matter what system we use the same kids will be top, middle and bottom, so we need to be careful. It is hard to reverse damaging changes to an education system. NOT EVERY STUDENT SHOULD BE GOING TO COLLEGE.*

*Please bring our concerns to DES and NCCA.*

*Over all I found the training provided by the JCT to be more aggravating than helpful.*

*I teach JCT science with a positive attitude and try to keep my students engaged and using inquiry based learning. I feel however that there is a stark difference between the knowledge and understanding as well as attitudes toward the subject from my previous science classes to now.*

*If the department are trying to lure people into STEM this is from what I can see, not having the desired effect.*

(Several related comments have already been quoted under other headings.)

## **18.6 Pressure and stress**

Below are representative comments of the teachers relating to stress.

*Thanks to the new J Cycle, I can't wait to get out of teaching! It is stressing me out on a daily basis and I am terribly unhappy. I note that I am not alone, but that doesn't remove the problem.*

*I have always been an innovative teacher and always encouraged students to research topics/explore outside the curriculum. My classroom is full of models (from years ago). Now that we 'have' to do it: I am completely panicked. The language of the Learning Outcomes on the poster is clumsy, tedious and that it needs to be interpreted through action verbs is an indication of this!*

*I feel that it's my first time in 22 years that I feel totally overwhelmed stressed inadequate as a teacher. Not good for the profession. I am very conscientious but I feel we are ill prepared to deliver a course in less time than we've ever had and without the resources that we need in a way that doesn't make sense to logical clear thinking scientists whose very subject is grounded on facts.*

*I have been very positive about the changes in general and am glad the issue of rote learning is being addressed. However I felt let down by the misinformation about the Assessment Task and I feel like I'm under a lot of pressure to prepare them for an exam that I know very little about myself.*

*I am worried about the inflation of grades of work marked in school and pressure on teachers to change them.*

*It is hard to write my full concerns about the new Junior Cycle in this short survey. I would like the NCCA to revisit the learning outcomes and come up with a list of concrete facts / knowledge that must be done by all students. I worry about CBAs effect on stressing students.*

*We as a dept. feel that we are doing less practical work than before.*

*While I am doing my best to teach the learning outcomes I know that others are linking them and doing much better.*

*Please push for a more concrete syllabus. Learning outcomes not working. The stress level amongst competent, conscientious junior science teachers is through the roof. Bring back a syllabus PLEASE.*

*I am very annoyed with the roll out of the new JC. It has caused a lot of stress on teachers of science and it didn't seem to be as stressful for other subjects as they are more straightforward with their new curriculum outline. I don't know why they seem to be complicating it so much for science teachers. It is too vague. There should be a percentage of the marks going towards the CBA's for the amount of work involved. 90% for the final paper is not acceptable with only 10% on assessment.*

*Too much parental influence in doing the CBAs. Also SLAR meetings causing a lot of friction between teachers in schools. If a teacher gives a lot of help to a pupil who is doing a CBA they will do better and so this reflects better on the teacher...this is a big problem as many teachers are under pressure from management and parents to give a lot of exceptional grades!*

*CBAs are great for the kids as an exercise /activity but I feel under pressure marking them for their JC Profile of Achievement, especially as many of our students and parents would have high expectations of themselves (and their teachers). It is also difficult to entirely 'park' what you know about a student, their abilities, aptitude and application, when assessing their work.*

*I have never put down as busy a year, there is so much more work for science teachers I haven't got lunch in months. I now teach 2nd yrs the same stuff as 5th yrs with much poorer retention. With all these new changes, I am looking at 14 yr olds getting turned off with overload of information. It's crazy and definitely not for the better!*

*Thanks to the new J Cycle, I can't wait to get out of teaching! It is stressing me out.*

## **18.8 Thanks for the survey**

Below are some comments of the teachers relating to the survey.

*Thank you for conducting this survey as I have been crying out for some evidence to see what others really think of this new course and where it is taking us and I will be looking forward to your conclusions when they are presented in April.*

*Thank you for the opportunity to share my concerns.*

*Thank you for doing this survey it is really important that our voices are heard*

*Great survey. Great for science teachers to have their say.*

*Would wish the ISTA would try present these findings to the DES as I'm sure the results of this survey will find most teachers unhappy with the new science course.*

*Thanks for conducting this survey.*

*A very useful survey - thanks.*

*Thanks for the invitation to complete the survey.*

*Well done on compiling survey, hopefully it will cause a rethink but I doubt it.*

*I hope this feedback along with others will be used to help improve the new junior cycle course. Thank you.*

## Conclusions and Recommendations

Our committee is very pleased at the very high response from science teachers to the questionnaire and also the gratitude expressed by these teachers at being given the opportunity to give feedback on their experience of implementing the Junior Cycle science curriculum over the past three years.

- It is of serious concern that a total of 85% of teachers expressed the opinion that they would find it unacceptable and would be dissatisfied if the Junior Cycle template for syllabus (specification) design were to be used for the proposed new Leaving Certificate biology, chemistry and physics syllabi.
- It is also of serious concern that 68% of teachers felt that students undertaking the Junior Cycle science programme will be either poorly prepared (38%) or very poorly prepared (28%) for the study of Leaving Certificate science subjects.
- We are very saddened to hear that concerns were raised by many of our colleagues relating to the high levels of stress, anxiety and frustration being experienced by them having to teach a curriculum in which they themselves have to try to work out what is on the curriculum. Words such as *stress*, *vague*, *frustration* and *depth of treatment* commonly appeared in the analysis of data. It is clear that the Junior Cycle science specification (syllabus) compares very unfavourably with the detailed specifications found at international level in other educational systems.
- A total of 61% of teachers indicated that they felt that the two Classroom Based Assessments (Extended Experimental Investigation and Science in Society Investigation) have a valuable place in the Junior Cycle science course. However, 58% of teachers commented that they did not have adequate time to teach these two Classroom Based Assessments in the spirit in which they are intended.
- Many teachers expressed dismay at the lowering of standards in science with a large number of physics teachers in particular expressing grave concern for the future of their subject at Leaving Certificate level. This does not reflect well on efforts to promote the STEM subjects in Ireland.
- We are pleased to see that teachers welcomed the increased positive focus on the scientific method, scientific skills, problem solving skills, critical thinking skills and applying these skills in a variety of contexts.
- Teachers expressed concern about the inadequacy of a common examination paper to cater for a wide range of student abilities.

## **Recommendation**

Our committee recommends that ISTA Council ensures that the comments made by the teachers in this report be brought to the attention of the relevant authorities with the request that steps be taken to address the issues raised and ensure a high level of cooperation with ISTA. In particular, the necessity for Depth of Treatment to accompany the current, and any future, syllabi (specifications) is absolutely imperative to uphold a high standard of science education.

This recommendation is in line with international best practice, as highlighted in the Hyland Report (2014) available at:

<https://www.ista.ie/wp-content/uploads/2016/11/The-Hyland-Report-.pdf>



## APPENDIX



### ***Irish Science Teachers' Association (ISTA) Junior Cycle Science Questionnaire***

The purpose of this questionnaire is to enable Science teachers to give feedback on their experience of the Junior Cycle science specification (syllabus). The questionnaire is short and your feedback will help the Council of ISTA to represent the views of its members to the Department of Education and Skills, the NCCA, the SEC and other stakeholders in education regarding Junior Cycle Science and also inform its recommendations for the implementation of new Leaving Certificate science syllabi.

Please ensure that you complete the questionnaire by 8 MARCH 2019. A report of the findings will be launched at the Annual Conference of the ISTA which takes place in Dublin on 12 -14 April 2019.

This questionnaire should take between 5 - 10 minutes to complete. Your time and feedback will prove invaluable to the ISTA in representing the views of science teachers.

1. How many years have you been teaching?

- 0 - 10       11 - 20       21 - 30       31 - 40       41+

2. Please indicate the level at which you teach / have taught.

- Second Level       Third Level       Primary Level

3. Please indicate the type of school in which you are teaching.

- Voluntary Secondary       Community / Comprehensive       ETB       Other

4. Please indicate the time allocation per week in your school for teaching Junior Cycle science to 1ST YEAR students. Please give your answer in total number of minutes

- 40 minutes       60 minutes       80 minutes       120 minutes       160 minutes       180 minutes       200 minutes

Please indicate the time allocation per week in your school for teaching Junior Cycle science to 2ND YEAR students. Please give your answer in total number of minutes

- 40 minutes     60 minutes     80 minutes     120 minutes     160 minutes     180 minutes     200 minutes

Please indicate the time allocation per week in your school for teaching Junior Cycle science to 3RD YEAR students. Please give your answer in total number of minutes

- 40 minutes     60 minutes     80 minutes     120 minutes     160 minutes     180 minutes     200 minutes

5. Are you involved with the JCT in the provision of CPD courses to practicing teachers?

- Yes                       No

6. Do you feel that Extended Experimental Investigations (EEI – CBA 1) and Science in Society Investigations (SSI – CBA 2) have a valuable place in the Junior Cycle science course?

- Yes                       No

Please explain:

7. Do you have adequate time to teach the Extended Experimental Investigations and Science in Society Investigations in the spirit in which they are intended?

- Yes                       No

Please explain:

8. Please indicate your level of satisfaction with the assessment criteria / Features Of Quality that are used in the assessment of CBA 1 & 2.

Very high     High     Average     Low     Very low

Please explain:

9. Please indicate the extent to which you feel students will be prepared for their study of Leaving Certificate science subjects by the Junior Cycle science syllabus.

Very highly prepared     Highly prepared     Adequately prepared     Poorly prepared     Very poorly prepared

Please explain:

10. Please indicate your level of satisfaction with the SEC Sample Examination paper for Junior Cycle Science.

Very high     High     Average     Low     Very low

Please explain:

11. As a common level paper, please indicate the category / categories of students for whom you think their needs are met best by the SEC examination paper.

Below Average     Average     Above Average     Exceptional

Please explain:

12. How many CPD sessions of science specific JCT courses have you attended?

- 0       1       2       3       4+

13. If you have attended one or more of the science specific JCT courses, please indicate your level of satisfaction with these courses.

- Very high       High       Average       Low       Very low

Please explain:

14. How many CPD sessions of whole school JCT courses have you attended?

- 0       1       2       3       4+

15. If you have attended one or more of the whole school JCT courses, please indicate your level of satisfaction with these courses.

- Very high       High       Average       Low       Very low

Please explain:

16. Based on your experience with working with the new template of specification at junior science level please indicate how you would feel if the specifications at Leaving Certificate sciences would be presented using the same template.

- Very satisfied       Satisfied       Unsatisfied       Unacceptable

Please explain:

17. Are you a member of the ISTA?

Yes  No

If you answered yes, how many years are you a member of the ISTA?

0 - 5  6 - 10  11 - 15  16 - 20  20+

How do you believe that the ISTA could further cater for your needs as a member of the association?

18. Any other comments?