

## MUSIC

## Overall grade boundaries

## Higher level

Grade:	1	2	3	4	5	6	7		
Mark range:	0-15	16-32	33-48	49-58	59-69	70-79	80-100		
Standard level group performing									
Grade:	1	2	3	4	5	6	7		
Mark range:	0-14	15-31	32-50	51-61	62-68	69-79	80-100		
Standard level solo performing									
Grade:	1	2	3	4	5	6	7		
Mark range:	0-14	15-31	32-47	48-58	59-71	72-82	83-100		
Standard level creating									
Grade:	1	2	3	4	5	6	7		
Mark range:	0-15	16-31	32-47	48-58	59-69	70-80	81-100		



## Solo performing (HL/SLS)

#### **Component grade boundaries**

Grade:	1	2	3	4	5	6	7
Mark range:	0-3	4-7	8-11	12-13	14-16	17-18	19-20

## The range and suitability of the work submitted

The solo performing submissions demonstrated a range of achievement levels, where a large number fared from appropriate to outstanding achievement.

In a number of cases the technical challenges in the musical programmes selected were considerable; yet so were the motivation and engagement of the candidates who were positively supported in meticulously honing the necessary skills to diligently pursue mastery and delivery. These approaches produced several performances where candidates demonstrated impressive range and depth in their musical learning.

It is evident that there was some superb preparation for music solo performing available for the candidates this session. There was often commendable attention to the nature and requirements of the component.

Despite some exceptions, the recordings were generally of good quality and could be played on high fidelity equipment. Microphone placement and overall balance were monitored so that the work of the candidate was displayed with prominence and suitable musical accompaniment was provided when needed.

In some cases the standard of preparation was weaker and the candidate work was less confident or informed.

## Candidate performance against each criterion

#### Criterion A

The repertoire was often thoughtfully chosen, presenting interesting musical explorations which were substantial and out of the ordinary in terms of content and expressive and technical demands. Overall, the choices of programme were well matched to the capabilities of the candidates. There was appropriate variety and some really interesting pieces presented. On the other hand some submissions consisted of a large number of very short pieces. These did not support the candidates in their demonstration of musical skill or communication abilities.



### Criterion B

The technical aspects of many of the performances were of a high standard. Mostly, the pieces matched the capabilities of the candidates. There were some instances where this was not the case and the candidates struggled to get through with technical inconsistencies. Phrasing, dynamics and tone colour subtleties were considered in most of the pieces. Several performances showed a real understanding of structure, with clear definition in the roles of musical lines and textures within the pieces. Some other performances were more functional, and did not really consider the importance of defining structural aspects.

#### Criterion C

There was a range of understanding of musical styles. From indistinct readings where no style was apparent to fully nuanced and informed renderings. There was stylistic variety in most submissions, and the majority of candidates showed some understanding of style

#### Criterion D

In terms of the candidates' abilities to communicate their re-creation of the pieces they selected, a variety of levels of achievement were demonstrated. In some performances the communication was not so convincing, or could be more or less effective according to the nature of the selections. In other instances recitals demonstrated highly consistent and effective musical communication.

## Recommendations for the teaching of future candidates

There is most diligent and effective guidance for solo performing in several schools this session. In a notable number of performances the candidates demonstrated commendable craftsmanship, intelligent musical understanding, maturity and flair. There were submissions, however, where the candidates' repertoire was either narrow in range or very familiar. It is recommended for the course to expose the candidates to pieces of music they may not so easily encounter, enlarging their horizons. In other instances recitals consisted of a series of pieces too short or too basic to demonstrate performance skills or effort; or of pieces performed without the required craftsmanship. For such cases a more systematic approach to performance is recommended, honing the development of music reading and expression skills, in order to support the candidates effectively.



## Group performing (SLG)

#### **Component grade boundaries**

Grade:	1	2	3	4	5	6	7
Mark range:	0-3	4-7	8-12	13-14	15-15	16-17	18-20

## The range and suitability of the work submitted

Although the number of submissions for this session was relatively small, the variety was interesting; presentations ranged from youth orchestra, jazz ensemble, and wind band through to mixed vocal and instrumental for a very large class of candidates. In more than one instance different ensembles were presented, for example, an orchestra reduced to a big band for part of the programme and the vocal and instrumental group reassembled as a rock band. One ensemble was more of a solo vocal with guitar accompaniment, rather than a group performance. Generally the standard was high, groups were well rehearsed and performed repertoire that was within their capabilities.

## Candidate performance against each criterion

#### Criterion A

Choice of repertoire was, for the most part, varied and interesting and well suited to the candidates' abilities. Some sophisticated choices in the orchestral programmes (Barber, Holst for example) and some excellent original compositions for a jazz ensemble made for enjoyable listening. One or two submissions were narrower in range and would have benefited from including a slower, more lyrical work in a programme of mostly short and lively works.

#### Criterion B

Technical precision from groups was variable with few really outstanding groups in this respect. In some cases, the marks awarded by teachers for this criterion were too lenient, particularly where intonation and rhythmic precision were issues in the performance.

#### Criterion C

Where ensembles submitted a varied performance, presentations generally demonstrated good understanding of the appropriate musical style of the pieces. Phrasing, articulation, balance and dynamics were addressed in most cases.

## Criterion D

Musical communication remained a strong positive overall. There was good evidence of collaboration and enthusiasm which was communicated in the performances.



## Recommendations for the teaching of future candidates

Continue to encourage and inspire students to work together in ensembles, with all the benefits to musicianship and technique that result, namely the fundamental principles of good rhythmic control, intonation, proper breath support and fluent technique. Ensure that there is more than one performance opportunity to record the performances as required.

## Further comments

Listening to the energy and music-making of young people from all over the world continues to inspire and is greatly appreciated.

## Creating (HL/SLC)

#### **Component grade boundaries**

Grade:	1	2	3	4	5	6	7
Mark range:	0-5	6-11	12-16	17-19	20-23	24-26	27-30

## The range and suitability of the work submitted

There were no instances of unsuitable work in the portfolios moderated by my team, with very few works that were too long and just one or two that were a few seconds under the three minutes, so this had practically no impact on the achievement level. Work ranged from those cases where candidates showed a compositional mind exploring different musical elements and a good knowledge of idiomatic possibilities, to cases where exploration was limited. Work that was of lower quality appeared to have been carried out with little guidance from the teacher. Most portfolios contained a variety of musical situations; instrumentation, style and genre with only a small minority offering, for example, three piano pieces. Compositions were by far the most popular component, and a portfolio with three compositions was the most common submission. Music technology creations were the second most popular component, followed by arrangements and, way behind, improvisations and stylistic techniques. Those who did include stylistic techniques could often have been better prepared for the task, although in general the work indicated the given material and where the candidate's own work began. There were not as many arrangements this session; candidates here seemed to apply themselves more creatively and there were fewer straight "transcriptions" than in previous years. There seemed to be less confusion this session, with regard to defining a music technology creation and a composition - candidates and teachers seemed to have a better grasp in differentiating the work. Teachers' comments on coversheets were usually methodical, informative and useful. Some of the arrangements lacked a copy of the original which had been worked from, but this was less frequent than in previous years.



## Candidate performance against each criterion

## Criterion A

In general, it was clear that many candidates had received teaching in compositional techniques and devices such a thematic/motivic development, imitation, and there was some good use of layering, with development often the result of adding a new 'layer' to the composition. Less successful entries often had good initial musical ideas but seemed to lack the skills to transform them. In these cases candidates simply moved on to another idea. In weaker work it was clear that candidates relied too heavily on trial and error rather than exploring chosen musical elements with intent. Stronger submissions included a choice of instrumentation that supported the creative intention of the work. Among lower scoring components were "minimalist" pieces that relied almost solely on repetition without making use of standard minimalist techniques: augmentation, diminution, phasing etc. Although there were fewer arrangements that simply transcribed the notes onto a new setting, some arrangements seemed to lose track of the original melody, which made them rather incommunicative. Pieces offered in "jazz" style were sometimes too generic offering little content other than the use of a blues scale over a twelve bar cycle, and little or no development of material.

## Criterion B

In general candidates were able to maintain a musical style, thus making the work cohesive. Use of "classical" structures often helped organise the work, and there were some good examples of pieces in variation form. Quite often, pieces "in sonata form" lacked the modulations that make such structures interesting and effective. Song forms were employed effectively, and often pop/rock songs were among the more cohesive works, although too often straight repetition of verse material with only a new text meant that content was a little lacking. Programmatic pieces were more popular in this session. This had the advantage of giving a certain framework and direction to the pieces but sometimes these pieces lacked musical integrity, relying on an understanding of the story to justify progressing from one idea to the next.

## Criterion C

Interestingly, candidates that were aware of the intrinsic idiomatic characteristics of each instrument were also often owners of good compositional minds. Good examples of idiomatic writing were usually accompanied by live recordings, showing the advantages to the candidates of getting to know the real instruments. There was some interesting and appropriate use of special effects: flutter-tongues, pizzicato slaps etc. and there were fewer examples of wholly inappropriate (humanly unplayable) writing. Technology pieces generally demonstrated good understanding of the potential of the software they had chosen and there was a little less reliance on pre-set solutions and Garage-Band type constructions.

#### Criterion D

The aspect of writing for transposing instruments seems to remain a challenge. Some candidates got round this (in a way) by stating "Score in C" at the top of the page, often however neglecting to correct the system name "Clarinet in Bb" for example. On the whole candidates



seem more and more confident with the use of notation software. Amongst the less complete scores were songs with just a vocal melody and chord symbols, and sometimes even just the lyrics with chord symbols. Elements that often made a difference between an excellent and just a good score might include simply forgetting initial dynamic or tempo indications or unconventional (and hence difficult to follow) positioning of the staves in the score. Higher scoring entries often included good performance detail such as bowing and phrasing. Candidates should take some more care in deciding time signature; some pieces in 6/8 were notated in 3/4 and some weaker entries had bar lines placed incorrectly. These things can occur easily when one is working just with computer playback (and perhaps with a lack of teacher guidance.) Music technology pieces were often well produced with good sound quality, appropriate sound levels and effective use of stereo panning. Recording effects were employed well and candidates generally showed a good understanding of the recording process. There were few examples of badly produced music technology creation.

#### Criterion E

Achievement here often mirrored that in Criteria A and B – that is, those candidates able to develop/extend their musical ideas with a clear idea of what they wanted to achieve, were more successful in shaping their work and creating expressive communicative music. Most candidates seemed to consider the importance of presenting a varied portfolio.

#### Criterion F

Most reflections set out to give an account of intention, process and outcome. Higher scoring reflections referred to models that had inspired them, the instrumentation/medium intended, and reflected on the actual compositional process, mentioning setbacks, decisions made and what was learned along the way. Less successful reflections gave little musical information, and one common weak point was a tendency to be too subjective, giving vague intentions lacking actual musical information. Some reflections offered a description of the completed work, like a programme note, rather than a reflection on the composition process. Weaker "outcomes" limited themselves to expressing satisfaction with the finished work. Some candidates presented reflections that seemed to be created in series, very similar to each other.

## Recommendations for the teaching of future candidates

For compositions: working with real musicians and getting to understand real instruments is beneficial. To try to instil in students the idea of development of material, with all its facets; this opens up the way to learning different musical techniques and the possibilities these can offer. To compose is not only to have good ideas but to have the craftsmanship to manipulate these ideas. The use of standard forms and formulae for compositions is useful: programmatic pieces can work but the danger is that they can become a series of unrelated musical events if they lack some thematic unity. Students presenting Stylistic Techniques should have a good grasp of the theoretical content of each component. Students could try reading back their own reflections to see if they recognise their work: the instrumentation, why it was created, and what it meant for their personal creative growth.



## Further comments

Some work was received with the teacher's comments on it. These were inevitably positive: it seemed at times as if the teacher was trying to point out to the examiner the strong points of the work.

## Paper one (Listening paper) (HL)

## **Component grade boundaries**

Grade:	1	2	3	4	5	6	7		
Mark range:	0-13	14-26	27-40	41-46	47-52	53-58	59-100		
Paper one (Listening paper) (SLS, SLG, SLC)									
Component grade boundaries									
Grade:	1	2	3	4	5	6	7		
Mark range:	0-9	10-19	20-29	30-37	38-45	46-53	54-80		

## General comments

This was the second time the shorter version of the paper (omitting question 8) was used at higher level, and it was notable that very few candidates missed out questions, suggesting that the time factor is no longer a problem. Undoubtedly this also contributed to there being very few responses at the lower end of the mark range. However, there were unfortunately very few responses in the upper mark bands either. At standard level too the distribution of marks followed a very similar pattern, with a concentration in the middle ground and very few responses at the lower or upper extremes.

In both cases this corresponded with the subjective perception of examiners that, while most candidates were able to provide adequate responses which nevertheless tended to be routine and formulaic, only a few were capable of demonstrating the kind of originality that merited a reward in the upper mark bands.



# The areas of the programme and examination which appeared difficult for the candidates

Candidates at both higher level and standard level seemed to find question 2 particularly challenging. Many responses suggested they were unprepared for it, and either tried to improvise, used a pre-prepared answer, or went off-topic altogether – even though the question was an obvious one to pose of a texted work. In addition, many higher level students clearly seemed to be challenged by question 3. Here responses often revealed an inadequate grasp of the concept of 'tonality'. Sometimes it was misunderstood completely as 'atmosphere', while the responses of those who did consider the term in its correct sense were often vague (for example, simply identifying keys used), confused it with 'harmony', and/or revealed basic theoretical shortcomings.

# The areas of the programme and examination in which candidates appeared well prepared

Question 1 drew on an aspect of Gershwin's work which all candidates were likely to have considered, and in general they seemed to be well prepared for it. At the same time many responses suggested memorisation of a prepared answer rather than critical engagement with the specific issues raised by the question. Recurrence of similar themes and examples, moreover, suggested origins in a common source such as a published revision aid. While there is in principle no objection to the use of such resources, candidates who simply recycle ideas from them, without demonstrating that they really understand them through the use of analysis and example, are unlikely to obtain high marks.

In general, many candidates provided evidence of ability in musical analysis; on the other hand, there was still a tendency to substitute description for analysis, or to substitute fanciful description in place of anything else.

# The strengths and weaknesses of the candidates in the treatment of individual questions

Section A

#### Question 1

This question was generally well answered, and some responses showed sound harmonic analysis relating to the use of what were seen as examples of 'jazz harmony'. There was, however, perhaps some over-emphasis on instrumentation, and an exaggerated claim for the relevance of the taxi-horn as a significant jazz feature. Examples of syncopation also tended to be unconvincing, and the feature sometimes seems to have been understood as a rhythmic characteristic exclusive to jazz.

#### Question 2

A less popular choice – see above for comments



### Question 3 (Higher Level only)

See above for comments

Section B

#### Question 4 Higher Level/Question 3 Standard Level

The presence of the score seemed to help candidates come up with stronger answers to this question. However responses often revealed a lack of knowledge of Baroque style, important here as a means of understanding the relationship between score and recording. Very few mentioned the use of *ritornello* form. Some responses also seemed to disregard the presence of the score; on the other hand, references to the 'organ' or 'terraced dynamics' suggested some candidates either hadn't listened to the recording, or were allowing the evidence of their eyes to override that of their ears. A number failed to identify the correct key, and some had learnt that Baroque music was 'contrapuntal/polyphonic', which clearly wasn't the case here.

#### Question 5 Higher Level/Question 4 Standard Level

Contextualisation of this Mahler extract seemed problematic for some. While many responses correctly located it in the late Romantic, some were clearly confused by its pseudo- (or neo-) 'classical' elements, and other suggestions (for example, 'Baroque') were definitely wide of the mark. Interestingly, although several candidates with perfect pitch correctly identified the second theme in the dominant, very few candidates mentioned sonata form – even though they would know from the rubric that this was the beginning of a symphonic work.

#### Question 6 Higher Level/Question 5 Standard Level

Some good responses here, with many candidates providing a clear outline of the work's sectional structure and even of its phrase lengths. Most also recognised the final 'swing band' elements and acknowledged that the work was some kind of 'fusion'. However, a fair number mistook its 'orientalist' features for authentic Middle Eastern influence, and the presence of a symphony orchestra misled many into categorising it as 'Western art music'.

## Question 7 Higher Level/Question 6 Standard Level

Many higher level candidates provided successful answers to this question and often demonstrated a fair level of familiarity with the genre, commenting on the use of the pentatonic scale and identifying the *erhu* and/or other traditional instruments. On the other hand, some candidates clearly had problems identifying both the cultural context and instruments used. Oddly, very few connected it with horse racing ('dance music' was a popular guess), and the 'galloping' erhu rhythm was frequently incorrectly described as 'dotted' or simply as 'bouncy'. Some candidates also mistook the solo instrument for a 'violin', and not a few seemed to hear a children's choir on the recording at certain points! With its fast-moving sectional form and use of several themes, description of the work's structure also proved challenging; some candidates described it as 'variations', but this usually involved simplification, or ignoring sections which didn't fit the scheme.



#### General comments on Section B:

There was a propensity here to make lists, rather than to note down specific perceptions arising from aural awareness. Making lists of observations is necessary sometimes, but it is never sufficient without some level of analysis and evaluation. Students should, for example, be careful to indicate variation within repeated structures as, for example, A - A2 etc.

## Recommendations and guidance for the teaching of future candidates

In Section A, candidates should be reminded that examiners are looking for evidence of critical engagement with the specific question in an imaginative, original manner. Use of memorised, pre-prepared responses, or provision of irrelevant material (for example, Gershwin's biography) is unlikely to provide such evidence. Reliance on revision aids is not necessarily to be discouraged, but candidates should not simply recycle ideas from them without sufficient analysis and explanation. They should also approach such resources in a critical spirit, and be aware that examiners may not agree with all the claims made in them. For example, some widely circulated sources describe the simple use of off-beats as 'syncopation' – a use of this term which IB examiners have agreed is unacceptable.

This also suggests that candidates would benefit from a more thorough introduction to standard terminology. The terms for describing texture ('monophonic', 'polyphonic', etc.) are frequently misused, with 'homophonic' in particular often misunderstood as simply a synonym for 'melody and accompaniment'. Some non-standard uses of terminology clearly derive from pop and jazz practice and – while perhaps appropriate there – are not really suitable in other contexts: examples include 'harmony part' (bass line), 'harmony' (accompaniment), 'rhythm' (pulse or tempo).

It should also be emphasised to higher level candidates that question 3 basically follows the same format each session, differing only in the musical element chosen. In their preparation, therefore, candidates need to consider the use of each musical element in the two prescribed works, and possible links and contrasts between such uses. This is a demanding exercise, but examiners are sensitised to this fact and will reward imaginative, convincing responses accordingly.

As for teaching the prescribed works themselves, suggestions of the examining team include: knowledge of their socio-historical context, in as far as this is relevant to their style and content; discussion of the work with peers using appropriate terminology; identification of characteristics and significant features, particularly in terms of musical elements and compositional devices; using such elements to analyse the relationship between different ideas and hence the work's structure; and developing the ability to respond to questions on these topics using appropriate language.

In Section B, candidates should be advised that answers need not be in the form of a structured essay, but are best presented as a list of timings indicating the beginning of important structural sections, with analysis of what happens in each of them, preceded or succeeded by comments on general features and context. Some responses also suggested that candidates need to be



reminded that 'duration' (as a musical element) refers to such features as rhythm, metre and tempo, and not to the duration of the track itself.

For HL question 4/SL question 3 specifically, candidates should be advised that is well worth listening to the recording, as there may be discrepancies from, or additions to, the printed score. The lack of references to *ritornello* in responses to this question, or to sonata form in question 5, suggest moreover that some teaching of the basic formal types encountered in Western art music would be of benefit to candidates. In question 6, the categorisation of the extract as 'Western art music' suggests that candidates need to be reminded that the sequence of the Section B questions is always the same: 2 x Western art music, jazz and pop, world music. Fusion works may appear, especially in the last two categories, but all examples will belong predominantly to the genres listed above, in that order.

## Musical Links Investigation (HL, SLS, SLG, SLC)

## **Component grade boundaries**

Grade:	1	2	3	4	5	6	7
Mark range:	0-3	4-6	7-9	10-12	13-14	15-17	18-20

## The range and suitability of the work submitted

There was a wide range of musical cultures and pieces chosen, with many comparing nonwestern cultures. Many candidates chose pieces that were complete in themselves (that is, not a fragment of a larger work) and their findings and observations were well supported by audio clips.

There is concern at the growing trend for some schools to follow a "template", suggesting that those MLIs have been directed by the teacher, rather than self-directed by the candidate as required (see Music Guide p 28). This becomes evident when schools of 5 - 6 candidates (or more) present their MLI in exactly the same format, with the same type of discussion, the same type of links and examples and, on occasion, the same pieces. In addition, it has been noted that these types of templates often misdirect the candidate in the MLI task, focussing on comparing and contrasting two musical examples with little regard for the cultures they are supposed to represent, and with little emphasis on finding substantial links. Comparing a wide range of different elements superficially is not the intention of the MLI.

## Candidate performance against each criterion

## Criterion A

For the most part, there was a clear delineation of Musical Cultures with some well-chosen examples and clear links. However, there were instances where the musical examples were



not truly representative of their cultures (for example selecting the Beatles' "Norwegian Wood" as an example of British Pop Music linked to Traditional Indian Music because of the use of sitar; or choosing piano transcriptions in, for example, Chinese folksong idiom, which are most often in a Western style, and comparing them with Debussy, also Western). There continues to be a number of candidates who select insubstantial links such as "the same meter", "both being in major mode" or "both being homophonic", and in these instances the scope for investigation is limited to the obvious. A new trend, perhaps derived from the "template" idea, is the introduction of a number of "mini-links", which has the effect of dissipating the focus of the investigation.

#### Criterion B

Different levels were achieved in this criterion – from some brilliant work where arguments were well discussed and supported with appropriate and clear examples to vague or general analysis. In many cases, several elements were addressed but few in detail and there were several scripts where the candidates made an analytical statement such as "the piece is in ABA form" but failed to back it up with musical evidence. There continues to be a number of candidates who rely on only referring to timings on the CD as musical evidence of points made, requiring the reader/examiner to continually refer back to the CD. There is still a tendency for candidates to examine only a small section of a piece in regard to the analysis of the link (often the first few bars). However, there were some excellent examples in relation to melodic shape/contour, and also strong scripts that were able to show the significance of rhythmic patterns in the construction of the music chosen. Candidates varied in their ability to contrast as well as compare in relation to the selected links.

#### Criterion C

Again there were different levels of performance against this criterion. Where the musical links were clearly delineated, and musical elements well defined, musical terminology supported the explanation and synthesis of the analysis. Those candidates who were able to show understanding and confidence in the use of range of terminologies succeeded well and created scripts that were satisfying to read. In contrast, there are a number of candidates who rely on presenting lists, or glossaries of terms from the various glossaries of terms from the various cultures, but then cannot apply them in their discussion nor show understanding of their use in context.

## Criterion D

There was some excellent organisation of the MLIs and a number of very well presented scripts in many forms. The quality of referencing was variable, with instances still of a lack of primary sources (more often scores which have been used for musical examples than audio) and a growing reliance on internet (especially Wikipedia) sources. It is encouraging to see an increase in the number of candidates acknowledging the source of illustrations, and there were some fine examples of good practice in applying footnotes and some referencing within the body of the text; however, this continues to be an area for development. Musical examples require clefs and key signatures to validate the examples.



#### Criterion E

The larger majority of scripts in this session followed the article/magazine format, with often striking graphics and innovative presentation. Those at the higher level of achievement showed good evidence of depth of understanding, creative thinking and a sense of engagement with the task. For those candidates working under a "template" guidance, this criterion suffered as there was little evidence of intellectual initiative, creative thinking and depth of understanding.

## Recommendations for the teaching of future candidates

Please ensure that the MLI is firstly a study of musical cultures with examples that are representative of the selected culture. For that the candidate needs to be familiar with the characteristics of the cultures selected and find appropriate examples. Secondly, if there are not links that are truly characteristic of these cultures, then research further and explore other cultures. Develop the student's skills by setting up opportunities to analyse/compare different pieces of music or sections of pieces to look at similarities and differences within the context of the pieces. Begin work on the MLI earlier on to allow time for developing a musical understanding of the issues at hand, both similarities and differences.

## Further comments

Please note that the MLI is an externally assessed component, so it is not intended to be marked by the teacher. The use of CD clips/timings is helpful, however it is important that tracks and the way they are attributed in the body of the essay correspond. Candidates should be made aware not to rely solely on CD timings as evidence of points made within the body of the MLI. (However, with effect from the May 2016 session the MLIs will be uploaded, so schools will not be sending CDs to examiners.) Candidates should be reminded that all musical examples require a clef and key signature to make sense of the pitch and harmony of the example; ideally instrumentation should also be included. A further point to make is on the harm that the use of templates is doing to the candidates: they result in taking away from the candidates the opportunity to direct their own research.

