

Promoting learning and preventing cheating

The development of examination formats and the launch of generative AI tools have made the issue of security against cheating in the examination of student performance more relevant than ever. Other forms of examination than those to which teachers and examiners are accustomed give rise to new questions about the scope for students to use unauthorised aids or otherwise cheat in examinations. This report is a result of discussions and conversations about students' cheating and attempts to deceive during 2021/2022 in a subgroup of the Priority group for assessment and examination methods¹ at KTH. The report was updated in March 2023 after AI tools such as ChatGPT had a major impact.

Summary

This report aims to provide a basis for further discussion on how KTH's programmes can be designed and implemented to reduce the extent of cheating. A dialogue on assessment and learning has been identified as a central and important part of the work to counteract cheating. A current and lively discussion about examination and learning is needed throughout KTH, both among teachers and students. A single way is not the right way - we need to do things in different ways depending on, for example, course, subject and level of education. The purpose of the report is to raise awareness of different forms of cheating and examination and to encourage discussion of examination, learning and cheating. For an in-depth and more comprehensive handling of plagiarism, which is one of several types of cheating, we refer to Carroll & Zetterling (2009).

According to the Higher Education Ordinance, disciplinary measures may be taken against students who attempt to "deceive during examinations or other forms of assessment of study performance". Since it is in the case of deceiving that measures can be taken, it is important that we as teachers know what is required in terms of clarity and information for the student to complete the examination correctly. Clear information about examination elements is also important so that students do not cheat by mistake.

Principles to reduce cheating at KTH.

- Students, teachers and KTH contribute to a culture of learning where cheating is not acceptable.
- Students at KTH want to learn and take responsibility for their own learning. Participation in teaching has an added value for students' learning.
- Reducing cheating is a matter of course design and educational pedagogy and not just something that is dealt with at the point of examination.

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- Courses should be designed to prepare students for examinations. When students know what they are expected to learn in the course, how this relates to their current level of knowledge and how the examination is organised, the risk of cheating is reduced.
- As a higher education institution, KTH should focus on supporting students in their learning rather than restricting examination forms to those that can be carried out in a controlled environment where the risk of cheating is limited. Individual examination in a controlled environment should take place at strategically relevant places in the educational programme, given the educational context.
- It is important that information before and during the examination is clear and that students are aware of the conditions for conducting the examination.
- Control measures shall be implemented whenever possible and appropriate.

Proposed measures for KTH, teachers and students

Below are suggestions for measures that KTH as a higher education institution can implement to prevent cheating.

- Take the initiative to create a KTH culture that puts learning first and where cheating and deceiving is not acceptable.
- Focus on supporting students in their learning. Identify where in the programme it is strategically important to have individual examination in a controlled environment.
- Introduce a common code of honour for the entire KTH.
- Organise activities such as reflection seminars on cheating prevention at programme level.
- Provide clear and targeted information on the disciplinary process.
- Create the conditions for effective reporting and handling of disciplinary cases.
- Recognise that there are ethical guidelines for KTH in each curriculum.
- Develop more comprehensive guidelines for examination and supervision during examinations².
- Ensure that there is a wide variety of examination formats within each programme.
- Disseminate good examples of examinations that promote learning and prevent cheating.
- Ensure that simple and effective control mechanisms are available to teachers, such as
 - plagiarism checking tools
 - exam invigilators
 - support for authentication and ID verification.
- Provide support to the notifier of suspected deceiving behaviour to process the results of verification tools so that the evidence is fit for purpose.

² KTH's current policy documents for first, second and third cycle education and qualifying programmes. <https://intra.kth.se/en/styrning/styrdokument/regler/utbildning-1.1117452>

Proposed measures for teachers can be found in Appendix 3, proposed measures for students in Appendix 4.

Introduction and background

The institution's ability to prevent cheating rests on two pillars: control and pedagogy. Furthermore, teachers, students and the university are jointly responsible for ensuring that cheating is minimised as far as possible. The starting point in this report is that everyone (KTH/teachers/students) wants to and can contribute to a culture characterised by the desire to learn. This means that proactive pedagogical efforts are in focus rather than controlling and disciplinary measures to minimise cheating. Assessment of students' knowledge and skills is complex, and solutions are not trivial but a complex interplay of different perspectives, factors, and stakeholders. A discussion on cheating needs to be able to take place from multiple perspectives simultaneously, recognising that different measures promote different behaviours and are better suited to different situations.

With this report, the group wants to provide several perspectives on cheating and contribute with a reflective and problematising approach to the issue. Given that the design of the examination is now widely discussed at KTH and KTH encourages more forms of examination, we also want to increase understanding and awareness of how the examination can be designed to reduce the risk of the student intentionally or unintentionally cheating.

This report and the proposals in it are based on KTH Vision 2027 on KTH's education, see Appendix 1, and the framework for future education (KTH's Education Board, 2022). Both these documents depict a culture of learning with responsible, independent, and problem-solving students who feel a sense of belonging and participation in the programme. The principles of the Future Education project emphasise student-centred learning and continuous assessment.

Key concepts

This section explains and discusses several important concepts related to cheating.

Cheating	Deceiving
According to the National Encyclopaedia dictionary, cheating means the <i>use of unauthorised methods or devices</i> . For an act to be classified as cheating, it must therefore be clear what the unauthorised methods or means are.	The Higher Education Ordinance does not mention the word <i>cheating</i> . Instead, the section on disciplinary measures uses the expression "attempt to deceive": Disciplinary measures may be taken against students who 1. use prohibited aids or other methods to attempt to deceive during examinations or other forms of assessment of study performance, [...].

In this report, we use the term *cheating* in educational contexts and the term *deceiving* in legal contexts.

What is deceiving and what is not?

Let us look at an example of the use of unauthorised aids without any attempt to deceive.

A student uses an unauthorised tool to solve a homework assignment, such as ChatGPT, but clearly states in their submission that ChatGPT has been used. The student has not made any attempt to deceive but has used an unauthorised tool.

Anyone who has used an unauthorised aid shall not be approved for the task. If an unauthorised aid is used, it is generally grounds for suspicion of attempted deceiving and must be reported to the president (according to Chapter 10, Section 9 HF). The Disciplinary Board decides whether there is an attempt to deceive.

It is likely that a student who uses unauthorised methods or aids in connection with an examination does so to get a better grade or a greater chance of passing. If there is a lack of clarity about what applies to the examination, a student may push the boundaries of what is permitted and go to the edge of the grey zone to make things as easy as possible. It is therefore important that the assignments are carefully formulated and make it clear to the students what is permitted and not permitted, and if the student does not follow this, it can result in a disciplinary measure, see the section *Possibility of taking disciplinary measures* below. The risk of a penalty can also act as a deterrent and thus discourages cheating. Nils Jareborg, who is a professor of criminal law, examines in his essay *Disciplinary responsibility for students who cheat or interfere* when the wording of the Higher Education Ordinance on attempting to deceive is applicable (Jareborg, 2002). Does it include full-blown deceiving or only attempted deceiving that is not completed? Must the misrepresentation relate to something relevant to the assessment of the examination? May the examiner refuse to assess the student's exam even though deceiving behaviour has not been proven by the disciplinary board? Anyone interested in delving into this is recommended to read Jareborg's essay.

Legal certainty and cheating in examinations.

It is easy to misunderstand and confuse the concepts of legal certainty and cheating in the context of examinations. Let's clarify the concepts.

The Swedish Higher Education Authority (Universitetskanslersämbetet) writes on page 14 in the instructions for fair examination (Herjevik, 2020):

The concept of legal certainty should be understood as "predictability in legal matters". The conditions for legal certainty are that there are clear rules that are published and applied faithfully and correctly by the law enforcement agencies.

For *legal certainty*, it is therefore important that it is clear what applies to the examination, both in terms of its organisation and content. Students should be able to rely on their performance being assessed objectively, factually and without bias. The higher education institution, examiner and course leader must comply with laws and regulations during the examination. Official course syllabus is also binding rules.

The reliability of an examination indicates how sensitive it is to cheat. A completely cheat-proof examination means that it is not possible to cheat without being detected. This is probably not possible. A maximal cheat-proof examination would probably require that the entire examination takes place in a fully controlled environment where ID documents are checked against social security numbers. The examiner can make a grading decision without being completely sure that no cheating has taken place. If there is a well-founded suspicion of an attempt to deceive, it must be reported and the examiner can await grading, but if there is no suspicion, a grading decision is made in the normal way. For example, not all examinations need to be supervised and students' ID documents need not be checked when it may be difficult to organise, such as in the case of a quiz or compulsory attendance at a lecture or study visit. Thus, the examiner does not always have to examine in a completely cheat-proof manner, but various forms of authentic examination (such as group work, project work and laboratory work) and easily feasible examinations (such as quizzes and peer-reviewed assignments) also have an important place in the programme.

It is in the university's interest that it is not possible to cheat on a degree. If it becomes known that it is easy to cheat within a certain educational programme, confidence in the educational programme and the higher education institution is reduced, and graduates from the programme may find it more difficult to gain employment. This means that it is also in the students' interest that there is no cheating culture within the programme.

Categories of cheating and anti-cheating measures

To be able to categorise different types of cheating in examinations for educational purposes, this report will use Sindre's taxonomy³ (Sindre, 2021) consisting of the following three categories:

1. Solo cheating - the types of cheating that students can do on their own, such as using unauthorised aids and plagiarism.
2. Collaboration - cheating together with other students doing the same examination task. This category includes both collaborations where stronger students help weaker ones and symmetrical collaborations where all students benefit equally from the collaboration.
3. Help from third parties (possibly paid) who are not attending the course. The help does not have to come from a person but can be text generated by an AI tool.

Sindre also presents a range of measures to reduce cheating from these three categories, while recognising that it is more difficult to prevent third party assistance. In general, to reduce cheating in all categories, he highlights the following four different types of measures:

- Cultural/attitude building measures, such as the use of the honour code.
- Disciplinary measures⁴: clear rules on what is classified as deceiving and the consequences of breaking the rules.
- Pedagogical measures: well-designed teaching and examination.

³ Note that neither *cheating* nor the terms in Sindre's taxonomy are mentioned in the Higher Education Ordinance, which regulates disciplinary measures. Sindre's taxonomy is not used in the handling of disciplinary measures at KTH.

⁴ Sindre uses the term *legal action* for disciplinary action.

- Control measures: checking students during examination or checking submitted work.

Challenges with examination

There are several perspectives to consider in examinations. In this section, we have chosen to highlight a few perspectives on examination that have emerged as relevant in discussions on how examination can better support student learning and at the same time be designed so that it is easy to do the right thing and the risk of intentional and unintentional cheating is kept low. For a deeper insight into cheating related to examination, we refer to Appendix 2 on programme perspectives and progression.

The importance of the difference between summative and formative elements in education and training.

The difference between summative and formative assessment is the purpose of the assessment. Summative assessment is examination-based and aims to assess students' knowledge to award a grade. Formative assessment is assessment for learning and aims to help students in their further learning. In formative assessment, it is therefore important that students can perform and make mistakes without affecting the course grade, and to receive feedback on their learning.

For students to feel confident in how they are assessed in the course, it is important that the course information clearly states which assessment elements are summative and which activities are formative. An assessment element that in some way has an impact on the grade is always at least partly summative. This applies even if this impact is relatively small, for example by contributing bonus points to a larger summative assessment element. It is only on summative elements (examination elements) that the student can legally deceive. It is not always possible to have purely formative assessment elements in a course, often resulting in formative assessment activities with summative elements. Although the main purpose of these assessments is formative, it is important for teachers to be aware that this is not necessarily the students' perception of the situation. In these cases, there is a risk that students place more emphasis on completing the task than on learning from it. On the other hand, there is a risk that students do not prioritise spending time on non-summative tasks.

Cost of different examination designs

Different forms of examination are differently susceptible to cheating. At the extreme end of the scale are unsupervised quizzes, where it can be very easy to cheat, and individual oral examinations, where it is very difficult to cheat without being detected. Cheating in examinations is only one of many aspects to consider when the teacher chooses how the course should be examined. In many cases, it is much more important that the examination has high validity (i.e., examines the right thing), that it favours student learning and that it can be carried out with the given staff resources. For example, creating new examination tasks every year (labs, project tasks, home assignments, quizzes, etc.) can reduce cheating, but costs a lot of time and can lead to well-functioning tasks being replaced by less well-functioning tasks.

Cost of different control measures

Different examination formats provide different opportunities to use control measures to make cheating difficult, prevent and detect cheating. For example, handwritten submissions and oral presentations are much more difficult to check for plagiarism than computerised submissions. Proctored examinations can be organised where students are examined for a short period of time, a few hours at most, and in a specific location on campus. Monitoring at home is not allowed and monitoring for a long period of time or when students need to be mobile is not practical. It is important to choose reasonable control measures based on the type of examination. If it is important to have a high level of control in an examination, you should choose a form of examination that is suitable for this.

Possibility to take disciplinary action.

To take disciplinary action, it is necessary to be able to prove both that the student did not follow the rules and that the student was aware of them. It is therefore not only from a pedagogical perspective that it is important to clearly explain the rules that apply, but also from a legal perspective. The rules must be clearly available to all students during the course. This can be done, for example, in the course memo or on a separate page in the course room that is clearly linked to from both the start page and the assignment itself. It is important that students are given enough time to familiarise themselves with the rules. Allowing the student to certify that they were aware of the rules at the time of the examination provides a basis for later demonstrating that the student was aware of the cheating, i.e., tried to deceive. This can be done, for example, by having the student answer an additional question where they certify that they knew the rules when submitting the assignment to be assessed (or during the oral examination). It is important that students have access to the examination rules in good time. It may be useful to know that Canvas has a standard responsibility question when submitting assignments. In written exams, the question of knowledge of the rules is usually replaced by the invigilator reading out the rules before the exam and thus all students are considered to have learnt what applies. For the same reasons as above, these rules need to have been available to the student before the exam.

Description of the current situation

To be able to work effectively to prevent cheating, it is important to understand the current situation at KTH. In this section, we have therefore chosen to summarise observations regarding the culture of cheating and the results of disciplinary measures, which emerged as relevant in discussions during the preparation of this report.

Culture of cheating

The culture around cheating at KTH varies both between programmes and student groups. Unfortunately, in many environments, there is a culture where the focus is on passing examination tasks at all costs, rather than on learning. In addition to the fact that the focus should be on student learning, this culture is also problematic from a cheating perspective,

as it risks increasing the students' tendency to use unauthorised means to complete the tasks.

Cultural differences that can lead to plagiarism.

Plagiarism is the most frequent reason why students are convicted by the disciplinary committee for attempted deceiving (Kyrk, Viberg & Axelsson, 2023).

When it comes to students' development of academic literacy, continuous pedagogical support within each discipline and subject is important. Students with a foreign background who have Swedish as a second language are, if not at KTH, then at many other higher education institutions, overrepresented among those convicted of plagiarism. There are several reasons for this, but perhaps the main reason is linguistic deficiencies that make it more difficult for students to convert information from their sources into their own text. In other words, they find it more difficult to "embed" information from other sources in their own work than students who are generally more linguistically confident and, above all, more confident as writers. In this context, it is not only a question of linguistic aspects.

It may also be that many of these students come from other teaching and educational cultures, where it may be considered impolite for a student to rephrase or question a teacher or other hierarchically superior person.

It can also be about educational traditions where students are expected to focus more on memorising and reproducing facts, as opposed to putting more emphasis on analysing, managing, and transforming facts into something of their own (Eklund & Lennartson-Hokkanen, 2019; Carroll, n.d.; Pecorari, 2019).

Disciplinary measures

Teachers are obliged to report all well-founded suspicions of attempted deceiving behaviour to the examiner, who then forwards the report to the president. If a case then goes to the Disciplinary Board, the board, chaired by the president, assesses whether misrepresentation has occurred and whether there was intent. More information about the Disciplinary Board can be found in the Higher Education Ordinance and on KTH's website⁵.

Unfortunately, a report can involve a relatively large amount of work for both the teacher and the examiner, as the Higher Education Ordinance has high requirements for evidence. In addition to the workload, the high requirements may cause the teacher to perceive a case in the disciplinary board as an examination of how well they have carried out their work.

However, the high standards are necessary for the disciplinary board to make an informed decision. A case that does not lead to a conviction can instead provide important feedback on the design of the course, which can contribute to positive course development. For example, such a case can show where there are shortcomings in the course information that can help the teacher to clarify the information for future course offering (and possibly also in other courses).

To help with the reporting process, each school has a disciplinary contact person to support the teacher who intends to report.

⁵ KTH's information on the administrative process of disciplinary matters, <https://intra.kth.se/en/utbildning/disciplinarenden/handlaggningen-1.204226>

The reactions of students who are reported vary. Some students take the report itself seriously, while others do not seem to be affected even by a disciplinary measure and in some cases return to the disciplinary board in new cases. The impact of disciplinary action on the student is also influenced by the timing of the decision. If the period of suspension coincides with important examinations, the student is affected much more severely than if it occurs during a less examination-dense period. In addition, if the suspension occurs during an ongoing group project in a course, the suspension may also negatively affect other group members.

Four typical reasons for cheating

There are several reasons why students cheat, which often require different actions. For a more comprehensive and relevant discussion to take place, the working group has identified four typical reasons, as shown in the box below. These are based on the group's collective experience, literature, and concerns within the teaching community.

Reason A:	The cheating is due to ignorance of the applicable rules, unclear boundaries, and lack of familiarity with how to act correctly, e.g., poor reference management.
Reason B:	The cheating is due to the student being under pressure, e.g. lack of knowledge near a deadline or at the time of the examination.
Reason C:	Cheating is due to lack of interest on the part of the student. The course is perceived as unimportant in the programme.
Reason D:	The cheating is due to a strategic unwillingness to complete the task. This can be manifested by the student hiring someone else to complete the assessment task.

Educational efforts and clear information to students can counteract cheating based on causes A, B and C. The working group believes that the work against cheating should prioritise these three causes.

Students who justify cheating based on reason D present a different type of challenge. Here, cheating is more difficult to limit through pedagogical considerations and methods, which means that other strategies are required. Combating this type of cheating should not "stand in the way" of other efforts and a variety of examination forms. However, the working group wants to emphasise that this type of cheating can be made more difficult by the following measures:

- Variation in forms of examination
- Variation in tasks (at different examination sessions)
- Examination forms where the student's identity can be verified.
- Examination forms where teachers and students meet.

Measures to reduce cheating.

From the literature and personal experience, we have collected a range of measures to prevent, deter and detect cheating. The measures have been categorised into Sindre's four categories: cultural, disciplinary, educational and control. The matrix below summarises the measures and the responsibilities of the student, teacher, and higher education institution in relation to them. Information on measures aimed specifically at teachers can be found in Appendix 3 and information on measures aimed at students can be found in Appendix 4. Further in-depth text on some of the measures can be found in Appendix 5. Students' views and thoughts on different measures are described in Appendix 6. Tips for teachers on choosing and designing examinations can be found in Appendix 7 for oral examinations, Appendix 8 for digital examinations and Appendix 9 for avoiding cheating with generative AI tools.

Actions	The student	The teacher	The higher education institution
<p>1. cultural</p>	<p>Find out about your rights and responsibilities. Read and follow ethical guidelines and the code of honour. Contribute to a culture of learning where cheating is not acceptable. It is the student's responsibility not to cheat.</p>	<p>Communicate the code of honour. Be a good role model yourself. Justify the rules that apply to examinations. Contribute to a culture of learning where cheating is not acceptable. Demonstrate commitment to student learning.</p>	<p>Focus on supporting students in their learning. Identify where in the programme it is strategically important to have individual examination in a controlled environment. Introduce a common code of honour for the entire KTH. Organise activities such as reflection seminars on cheating prevention at programme level.</p>
<p>2. disciplinary</p>	<p>Find out what is allowed and not allowed in examinations. Be aware of the consequences of attempted misrepresentation.</p>	<p>Provide clear information on the applicable rules both before and during the examination. If necessary, ask a rule knowledge question. If there is a well-founded suspicion of an attempt to deceive, always report it to the president. Know how the disciplinary process works,</p>	<p>Provide clear and targeted information on the disciplinary process. Create conditions for handling disciplinary matters effectively. Recognise that there are ethical guidelines for KTH in each official course syllabus. Develop more comprehensive</p>

		what constitutes a <i>reasonable suspicion of attempted misconduct</i> and why it is important to report.	guidelines for examination and examination supervision.
3. pedagogical	<p>Find out how the knowledge gained will be useful in later courses or in professional life.</p> <p>Read the instructions for the exam carefully. Point out to the teacher if anything is unclear.</p> <p>Participate actively in class, including in non-compulsory activities.</p>	<p>Be clear about what aids can be used and what cooperation is allowed in each examination.</p> <p>Have a clear constructive alignment in the course.</p> <p>Write clear grading criteria and communicate them to students.</p> <p>Show the purpose of the course and where the knowledge is useful.</p> <p>Design the examination so that it encourages learning, not cheating.</p> <p>Construct original tasks.</p> <p>Individualise tasks.</p> <p>Give new assignments every course offering.</p>	<p>Ensure that there is a wide variety of examination formats within each programme.</p> <p>Disseminate good examples of examinations that promote learning and prevent cheating.</p>
4. controlling - preventing cheating - detecting cheating	<p>Check carefully what aids can be used and what cooperation is allowed in each examination and make sure to follow these rules.</p> <p>Do not contribute to cheating by providing unauthorised assistance or making available solutions to ongoing examinations.</p>	<p>Use oral (partial) presentations with ID checks.</p> <p>Checking submissions for plagiarism.</p> <p>Group assignments should also have elements of individual examination.</p> <p>Ensure that assessing teachers and TAs keep in touch during the assessment process and discuss suspected cases of plagiarism and unauthorised cooperation.</p>	<p>Ensure that simple and effective control mechanisms are available to teachers, such as plagiarism checking tools, invigilators, support for authentication and ID checking.</p> <p>Provide support to the reporter of suspected deceiving behaviour to process the results of verification tools to make the evidence fit for purpose.</p>

References

Carroll, J. (n.d.) *Plagiarism from a Swedish and an international perspective* [video] Jönköping University. <https://guides.library.ju.se/c.php?g=694262>.

Carroll, J., & Zetterling, C.M. (2009). *Guiding students away from plagiarism*. Stockholm: KTH, ISBN: 978-91-7415-403-0
<https://kth.diva-portal.org/smash/get/diva2:498928/FULLTEXT01.pdf> (Please note that the English version of the handbook starts on page 86)

Eklund, H. M., & Lennartson-Hokkanen, I. (2019). *Textstrategier för akademiskt skrivande – en smidigare övergång till högre studier*. I: Aldén, K., & Bigestans, A. (Ed). *Litteraciteter och flerspråkighet* (Första upplagan). Stockholm: Liber

Herjevik, M. (2020). *Rättssäker examination* (Fjärde upplagan). Universitetskanslersämbetet 2020. Diarienummer: 32-314-18.
<https://www.uka.se/download/18.16cf0f8c1849df46622152/1669103146069/Vagledning-2020-01-16-rattssaker-examination.pdf> (In Swedish)

Jareborg, N. (2002). *Disciplinansvar för studenter som fuskar eller stör*. I: Disciplinregler, konferens 16 oktober 2002. Stockholm: Högskoleverket.
<https://www.hb.se/globalassets/global/hb---anstald/studenttratt/disciplinansvarforstudenter.pdf> (In Swedish)

KTH (2012). *KTH Vision 2027*. Vision document for KTH adopted by the KTH Board. [KTH Vision 2027](#)

KTH's Board of Education. (2022) *A framework for the future of education at KTH*, Stockholm: KTH, document number: V-2021-0870.

Kyrk, P., Viberg, A., Axelsson, S., (2023). *Disciplinärenden 2022 vid universitet och högskolor*. Universitetskanslersämbetet. Rapport 2023:23. Diarienummer: 32-00543-22.
<https://www.uka.se/download/18.1d4dbfb018697503dac35b9/1678799498261/Rapport-disciplin%C3%A4renden-2022.pdf> (In Swedish)

Pecorari, D. (2019) *Plagiarism and academic literacy: What EAP teachers need to know* [webinar] Academic ELT online conference 29 October-31 October 2019. Cambridge University Press. <https://www.cambridge.org/elt/blog/2019/11/01/plagiarism-academic-literacy/>

Sindre, G. (2021). Can cheating on home exams be prevented? *Nordic Journal of STEM Education* 5(1), MTN conference 2021, DOI: <https://doi.org/10.5324/njsteme.v5i1.3918> (In Swedish)

Appendixes

1. Starting points from KTH Vision 2027
2. Programme perspective and progression
3. Information for KTH teachers
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5. Actions, in-depth discussion
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Appendix 1

Starting points from KTH Vision 2027

This report and the proposals in it are based on KTH Vision 2027⁶ about KTH's education. Specifically, the following aspects have been leading in the work:

- KTH is recognised as an innovator in science and technology education.
- Every student feels connected to and involved in our development.
- KTH puts the student at the centre of its education.
- Getting into KTH is seen as a chance to get an exclusive education and inspires students to succeed in their studies.
- KTH graduates are driving forces in the development of society and technology. The programmes stimulate independent thinking, creativity, and a curious and critical view of existing technology. Engineers and architects come up with solutions that involve both innovations and improvements with a clear social dimension, a clear focus on sustainability issues and, for some, even an artistic dimension. The security of professional roles can only be guaranteed by a stable base of solid subject knowledge combined with up-to-date and relevant professional skills.
- Independence, initiative, and problem solving are essential skills to be emphasised in the training.
- Engineers and architects from KTH will continue to be world class. Sweden does not compete primarily with narrow skills in individual subjects. The Swedish engineering tradition provides the habit of open tasks, applications and problem solving. KTH cultivates a culture characterised by solid basic skills, creativity, communication, and ingenuity - important qualities to have in an international context.

⁶See <https://intra.kth.se/styrning/styrdokument/mal/vision2027/kth-s-utbildning-1.1015231>

Appendix 2

The programme perspective and progression

KTH is a pronounced programme university where most of the courses that students take are part of the curriculum for a study programme. This makes it possible to accommodate a variety of examination forms and methods without making the examining elements very small or increasing the individual teacher's workload on a large scale. The programme perspective also means that students can reuse previously acquired knowledge and skills in later courses, which means that these can be integrated into more complex contexts. From a programme perspective, it is also not necessary for each individual examination element to take place in a controlled environment. Individual examination in a controlled environment should take place at a few strategic examination points in each programme. The programme perspective then helps to create a balance between increased diversity in the examination and the need for control measures to make cheating more difficult.

Examination and assessment of student performance is the part of the programme that is affected by most stakeholders and is the most difficult to change. The nature of the subject and the teacher's previous experience of examination has a direct impact on how the examination is perceived and designed. Adapting and developing the examination in an existing course may mean that the course implementation also needs to be developed to maintain the constructive alignment at course level.

To achieve this, both skills development and targeted pedagogical support may be needed.

Progression in a digitalised world

Digitalisation and a digital world mean that both the form and content (how the subject is examined) may need to be developed³. This could include an increased use of off-loading in examination, as students often need to reuse knowledge and skills in several courses. Off-loading in this context means that the student is allowed to use appropriate aids to solve certain tasks for the purpose of cognitive relief, and thus be able to focus more on the examination part⁷. In addition to the increased focus on the examination part, offloading also has the potential to increase the authenticity of the examination, as professionals often do not carry out the work that they can get better results from offloading³. For offloading to be used, however, it is required that the learning outcomes for the examining elements are carefully thought out and documented for all courses in the programme and that the order in which the students can take the courses is limited by correct entry requirements. In this way, it is possible to determine which knowledge and skills have been examined in previous courses and thus could be unloaded. This also makes it easier to create constructive alignment within the courses, since examination with well-considered relief is based on a consideration of which learning outcomes are examined.

⁷ Dawson, P. (2020). Cognitive Offloading and Assessment. In: Bearman, M., Dawson, P., Ajjawi, R., Tai, J., Boud, D. (eds) Re-imagining University Assessment in a Digital World. The Enabling Power of Assessment, vol 7. Springer, Cham. https://doi.org/10.1007/978-3-030-41956-1_4

Relief is not primarily a tool for minimising cheating, but it could have positive effects from this perspective as well. Partly because students are allowed to use aids that would otherwise be classified as cheating, but also because they can now have more time and energy to solve the actual task. Relief can also increase the authenticity of the examination, which could lead to students finding the task more meaningful and thus less likely to cheat.

Appendix 3

Information for KTH's teachers

The purpose of this information is to support you as a teacher in how you can work to promote learning and thus prevent cheating. The suggestions below should be seen as good advice and examples that you can use in the development and design of your teaching and examination. The suggestions are not comprehensive but aim to inspire you and provide new perspectives.

As a teacher, you can help prevent students from cheating by:

- 1) promoting a study culture in the student group that focuses on learning, where cheating is not acceptable.
- 2) preventing and discouraging cheating with pedagogical methods.
- 3) checking for cheating and reporting attempts to deceive.

In teaching

- **Show commitment to student learning.** Our experience is that students who have a relationship with the teacher and feel that the teacher cares about student learning in the course are less likely to cheat in examinations. Teacher enthusiasm can also reduce students' cheating tendency⁸.
- **Communicate and adhere to codes of conduct (e.g., code of honour)** Reflect on what this means in practice, in your course. Allow students to be involved in such discussions.
- **Clear constructive alignment in courses.** This means teaching what you will be examining and examining so that the students show that they have achieved the learning outcomes. Teaching should contribute to supporting students in developing the knowledge and skills they are expected to demonstrate in the examination.
- **Express expectations and tacit knowledge.** By being clear about the expectations you have of students and discussing these with students, students are more likely to 1) know what is expected of them and 2) be able to develop the knowledge and competences referred to in the course.

Choice of approaches and communication about them in examinations

- Consider when it is appropriate to work with measures that prevent, hinder, or detect cheating.
- **Make it easy to do the right thing.**
 - Reflect on why you have certain behavioural rules for your examination, e.g., that students should not cooperate with a homework assignment or that they

⁸ Orosz, G., Tóth-Király, I., Bőthe, B., Kusztor, A., Üllei, Kovács, Z., & Jánvári, M. (2015). Teacher enthusiasm: a potential cure of academic cheating. *Front. Psychol.* 6(318). DOI: 10.3389/fpsyg.2015.00318

are not allowed to use certain aids. How can you help students to comply with the rules and how can you follow up on compliance?

- Communicate in the course about what applies, verbalise hitherto unspoken guidelines, for example on how to cooperate in the examination and otherwise during the course. Give examples.

To prevent and make cheating more difficult, you can...

- write clear grading criteria and communicate these to students. Formulating and using grading criteria in the course is a way of making it clear to students what is expected of them.
- in teaching and prior to the examination, clarify what is expected and sought in the examination of the course.
- individualise tasks.
- construct original/varied tasks and new tasks each offering of the course (this must be balanced against the work involved in construction and the quality assurance of using tested tasks).
- use oral (partial) presentations.
- allow the students, within a given framework, to choose how the assignment should be presented. This gives each student the opportunity to demonstrate their knowledge in a way that suits them, based on their own conditions.
- be aware of and follow national and local guidelines for examination.
- introduce an individual element in each group work.
- if group assignments are presented orally, be clear already in the course memo that the students are examined individually, and that targeted questions are asked to the various group participants at the time of presentation.

To detect and report cheating, you need to...

- check submissions for plagiarism ([Supported in Canvas](#))⁹
- carry out an oral check/presentation of home assignments and labs.
- carry out ID checks.
- ensure that assessing teachers and TAs keep in touch during the assessment process and discuss suspected cases of plagiarism and unauthorised collaboration.
- provide the information needed for the examination and, if necessary, ask a rule knowledge question.
- if there is a well-founded suspicion of an attempt to deceive, always report it to the president ([instructions](#))¹⁰. Each school has a contact person to help with the report.
- know how the disciplinary process works, what constitutes a *reasonable suspicion of attempted misconduct* and why it is important to report.

⁹ Plagiarism review using Ouriginal, <https://intra.kth.se/en/utbildning/systemstod/canvas/applikationer/ouriginal/plagiatoversyn-med-hjalp-av-ouriginal-1.1236014>

¹⁰ Report a suspicion of a disciplinary offense, <https://intra.kth.se/en/utbildning/disciplinarenden/anmalan-av-disciplinarende-1.204198>

Appendix 4

Information for students

It is in the interest of both teachers and students to maintain an atmosphere of transparency that is characterised by mutual trust and confidence. Both teachers and students contribute to the quest for knowledge in a positive academic spirit. The education is intended to instil a professional work approach, including for instance professional integrity, understanding and acceptance of responsibility¹¹.

The purpose of this text is to show how you as a student can contribute to a culture of learning where cheating is not acceptable.

- Find out about your [rights and responsibilities](#)¹².
- Read and follow ethical guidelines and the code of honour.
- Find out what is allowed and what is not allowed in examinations.
- Be aware of the consequences of an attempt to deceive.
- Find out how the knowledge gained will be useful in later courses or in professional life.
- Read the instructions for the exam carefully. Point out to the teacher if anything is unclear.
- Teaching is designed to support your learning; therefore, actively participate in teaching even in non-compulsory activities.
- Check carefully what aids can be used and what cooperation is allowed in each examination and make sure you follow these rules.
- Do not contribute to cheating by providing unauthorised assistance or making available solutions to ongoing examinations.

¹¹ From the EECS Code of Honour for students and teachers, <https://www.kth.se/en/eecs/utbildning/hederskodex/inledning-1.17237>

¹² Rights and responsibilities, <https://www.kth.se/en/student/studier/rattigheter-och-skyldigheter/rattigheter-och-skyldigheter-1.1148520>

Appendix 5

Actions, in-depth discussion

Pedagogical measures

The aims of the pedagogical measures primarily are that the students should:

- be supported in their learning.
- have a professional and present relationship with the course teachers.
- familiarise themselves with the conditions and requirements for conducting the examination.
- experience that the examination is carried out in a relevant and fair manner.

Clarity towards students

To support students' learning and reduce the risk of students inadvertently committing cheating, it is important that KTH and its teachers have clear communication with students, both in terms of pedagogical design choices and regulations regarding examinations. In communication with the students (e.g., in the course memo and/or in the learning platform), the teachers need to be clear about which learning activities are formative and which are examining/summative. Sometimes formative feedback and summative assessment can occur in the same learning activity, e.g., in the case of a partial exam that can give bonus points on the final exam (summative feedback) and when solution proposals/marking templates are published (with the aim of providing formative feedback). It is appropriate both to define what is allowed/unallowed co-operation in connection with an examination task, and to explain the pedagogical ideas behind this choice. In the case of continuous examination, it is also useful to explain how this particular examination task is linked to the final examination. For unsupervised examination, it is appropriate to remind students of the code of honour in the course memo and that they need to actively confirm that they understand that the learning activity in question is an examination and the rules that apply to it. Sometimes the examination framework needs to be concretised, e.g., by the teacher discussing real or imaginary cases with the students.

Cultural measures

An important way to prevent cheating is to promote a culture where knowledge and skills are put first and where the examination is not seen as an obstacle that can be overcome by unauthorised methods. Cultural measures also include providing information about what is allowed and what counts as cheating and the effect of cheating on skills that may be needed in later courses or in the labour market.

A common basis for the study culture at KTH can be found in each curriculum under the heading of ethical behaviour:

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.

- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.

As the rules of the curriculum are binding for both teachers and students, these three points are very important.

Some ways to promote a good study culture in education:

- **Show commitment to student learning.** Teacher enthusiasm can reduce students' propensity to cheat¹³. Students who have a relationship with the teacher and feel that the teacher cares about their learning in the course are often less likely to cheat in examinations.
- **Communicate and follow the rules of conduct that exist (e.g., the ethical approach of the syllabus and any code of honour).** Discuss what this means in practice, in your course. Allow students to be involved in such discussions.
- **Express expectations and tacit knowledge and work with it in your teaching.** By being clear about your expectations of students and discussing these with students, students are more likely to know what is expected of them and to develop the knowledge and skills described in the course objectives. If it is unclear what cooperation is allowed for an examination task, some students may take advantage of this to take too much help from others while other students may feel insecure and not dare to cooperate in the way the teacher intended. Information alone is not enough, but it is important that students work on this in the classroom, for example through formative assessment such as practice tests, self-assessment, and peer assessment.

A school, programme or institution may adopt a code of honour to which its teachers and students are expected to adhere. One example is the EECS Code of Honour¹⁴ adopted in 2018, which is based on the 2002 Department of Numerical Analysis and Computer Science Code of Honour, which in turn is based on the Stanford University Code of Honour. At the beginning of each academic year, students in EECS programmes are asked to take a code of honour quiz, tick that they have read and understood the code of honour and answer three questions that apply to the code of honour.

Another way of influencing the culture is to carry out an activity in which students can reflect on and discuss where the boundaries of cheating lie and what cheating in examinations can lead to. Since 2011, the programme-coordinating course for the Master of Science in Computer Engineering has included a reflection seminar on the theme of plagiarism and personal responsibility¹⁵ where the students are asked to reflect, both in writing and orally,

¹³ Orosz, G., Tóth-Király, I., Bóthe, B., Kusztor, A., Üllei. Kovács, Z., & Jánvári, M. (2015). Teacher enthusiasm: a potential cure of academic cheating. *Front. Psychol.* 6(318). DOI: 10.3389/fpsyg.2015.00318

¹⁴ School of Electrical Engineering and Computer Science (2019). *Code of honour for students and teachers*, <https://www.kth.se/en/eecs/utbildning/hederskodex/inledning-1.17237>

¹⁵ Kann, V. (2020). *Plagiarism and personal responsibility*, reflection seminar in DD1390 Programme Coherent Course in Computer Science, <https://canvas.kth.se/courses/12140/assignments/105724> (In Swedish)

on plagiarism, cheating, personal responsibility and the code of honour, including taking a position on whether some of the cases described are cheating or not.

Disciplinary measures

Role of the Disciplinary Board and disciplinary measures

According to the Higher Education Ordinance, Chapter 10, Section 1, disciplinary measures may be taken against students who use unauthorised aids or otherwise attempt to deceive during an examination or when a study performance is otherwise assessed. Attempting to deceive means, for example, that the student uses unauthorised aids in a written exam, plagiarises another student's essay (or equivalent) or allows another student to indicate their presence on the attendance list when the student is not present¹⁶. Furthermore, it is an attempt to deceive if the student allows someone else to carry out the assessment-based performance. Justified suspicion of attempted misrepresentation must be reported to the president (Higher Education Ordinance, Chapter 10, Section 9). This means that it is the president and the Disciplinary Board that decide whether the student has been guilty of misrepresentation.

Information on how to report a suspected disciplinary offence and what documents should be attached to the report can be found on KTH's intranet (Reporting a disciplinary matter¹⁷). As a reporter, you can also turn to your school's contact person or to KTH's administrative lawyers for support.

The number of decided disciplinary matters at KTH was 78 in 2020, 134 in 2021 and 137 in 2022. Each case concerned one student. In 2022, the average processing time for a disciplinary case was just under 4 months. For national statistics on disciplinary matters, see Kyrk, Viberg & Axelsson (2023).

Reflections from the working group

In preparing this report, the working group has identified that some teachers feel uncertain about how to write a report. In particular, the need for teachers to inform themselves about the requirements for the documentation to be submitted has been recognised. For example, it would be desirable to clarify what is important to consider as a reporter from an administrative law perspective. Examples of such clarifications could include documentation in plagiarism cases where text matching tools are used and explanations of what in the investigation requires a high degree of accuracy and clear evidence. The group believes that a clear and simple process description would be helpful for reporting staff. While the group emphasises that disciplinary measures will continue to play an important role in curbing student misconduct and contributing to fairness, it argues that this is not enough, and that cultural and pedagogical measures are essential.

¹⁶ KTH's information on report of disciplinary offence <https://intra.kth.se/en/utbildning/disciplinarenden/anmalan-av-disciplinarende-1.204198>

¹⁷ Information on how to report a disciplinary offence <https://intra.kth.se/en/utbildning/disciplinarenden/anmalan-av-disciplinarende-1.204198>

Appendix 6

What do students think?

In May 2021, all students in the Programme Integrating Course in Computer Science Engineering year 1-3 and the Master's Programme in Computer Science, years 1-2, were asked which measures could be effective in preventing cheating. Students were asked to rate the effectiveness of 12 proposed measures on a scale from 1 (no effect on reducing cheating) to 5 (very good effect on reducing cheating). Below are the averages for the total of 803 responses from 5-year courses. Measures that students on average consider most fruitful are thus at the top of the table.

What measures do you think are effective in preventing cheating by D students?	mean value
Plagiarism check of submissions in Canvas and Kattis	4,3
ID check for all presentations and exams	3,9
Detailed instructions for each examination on what are allowed and not allowed.	3,8
Individualised tasks (i.e., different students get different tasks)	3,8
Extended suspension for cheating detected and convicted by the Disciplinary Board	3,6
Camera surveillance for home exams	3,4
Oral presentation/check of all home exams, homework, and labs.	3,3
Oral exams instead of classroom exams and written submissions	3,2
Reflection seminar on plagiarism and personal responsibility	3,1
Other measure (specify in the comment)	2,9
That ethical behaviour is regulated in the curriculum.	2,6
That the EECS Code of Honour is linked to from the course information.	2,4
Introduce more time pressure for home exams, homework, and labs.	1,8

Anyone who wanted could also comment further. Here are some comments:

I believe that D students will be less likely to cheat if efforts are made to create a strong sense of pride in their own work. In my experience, it has rarely been the students who believe they can do a task and are proud of their own work who cheat. But rather those who only see grades as a letter on a piece of paper. Therefore, I do not believe that introducing more disciplinary measures will have much impact on cheating.

Tasks can simply be done in such a way that they cannot be googled directly for an answer. If a student solves the task on their own, with or without the help of related information on the internet, they have demonstrated understanding. Being able to find new information and understand it quickly to solve a problem is at least as good as already knowing what was needed for the problem.

"Introduce more time pressure for home exams, homework and labs." will only make students cheat even more. Out of a sense of fairness (previous students had it easier), fear (harder to pass the exam, must pass the exam for various reasons), or simply in pure protest.

One missing option: better teaching and fair examination.

Fewer students will cheat if they simply feel they don't need to cheat. This may seem obvious, but even though KTH seems to think that most students would happily click a button to cheat their way to a clear exam in 5 minutes, I believe that the overwhelming majority are here to learn, and preferably to earn their grades.

Please also look at how some courses at KTH fail 70% or more at each examination, and how some rather give out A's at almost 70%. The right answer is probably somewhere in between, but it's certainly not right today.

Appendix 7

Oral examination and cheating

Oral examination can be carried out in many ways. The main types of oral examination are presentation (by one or more students), teacher-student interaction and discussion between several students. These types can be mixed, for example, so that the student first presents and then receives questions/follow-up questions from the teacher (or another student). Oral examination can be carried out both physically and digitally, and the difference between the two need not be great. Follow-up questions and other interaction during the oral presentation make it more difficult to cheat.

Oral examination makes several types of cheating more difficult.

- Solo cheating: It is difficult to use unauthorised aids during the oral examination without being seen, especially if the teacher is in the same room as the student.
- Collaborative cheating: During an oral presentation it is very difficult for the student to collaborate with someone else without being easily observed. If the teacher suspects that unauthorised cooperation has taken place during the preparation of the examination (in problem solving, programming or similar), the teacher can often reveal whether unauthorised cooperation has taken place through control questions, not least about the process. It is very difficult for a student who has been helped and does not fully understand the task to explain the solution.
- Third-person cheating: ID checks make it easy to see that the right person is being examined in an oral examination. Always ask the student to show ID before the examination.

Oral examination can be mixed with written examination and other types of submissions and projects. Here are some examples:

Oral presentation of a programming task

Students present the programming task (often in pairs) to a TA, either in a computer room or in Zoom. During the presentation, the TA tests that the program works (if not already done with an automatic program tester, such as Kattis) and then asks questions about the program to one student at a time, so that each student in the group can show that they can explain the program code and why it is designed the way it is. A presentation normally takes between 5 and 15 minutes, depending on whether Kattis is used and the size of the task. Provide TAs with appropriate test cases (unless automatic program testing is used) and assessment criteria.

Oral presentation of a take-home exam (sometimes called a mastery test).

The students submit a written solution in Canvas and make an appointment for an individual oral presentation. If it is a course with many students, many teachers or TAs need to receive presentations. Develop an assessment protocol for the assessment. The first question in the assessment protocol should be whether the student has read and followed the rules for aids

and co-operation. Hold a grading meeting before the presentation with all assessors and review the assessment protocol. Allow time for assessors to review the written submissions of the students for whom they receive presentations. It is probably more effective to give students verbal feedback at the presentation than to formulate written feedback. At the presentation, the assessor checks the ID and then goes through the assessment protocol, asking questions and giving feedback. An oral presentation normally takes between 10 and 20 minutes, depending on the number of tasks the student presents and the size of the tasks. It may be possible to allow students to book sessions of different lengths depending on how many tasks they want to present.

Oral presentation of projects

Oral project presentations can be combined with peer assessment/opposition. At the presentation, both the project author and the peer assessor/opponent/opposition group should be present and given time to present orally. If it is a group project, it should be clear in advance whether all group members will present orally or whether it is sufficient for some to do so. As the oral presentation is normally a programme/examination objective, it is good if the opponent and/or the teacher gives feedback on the presentation itself. The student/group should receive questions from the teacher and the opponent to be answered orally.

Video presentation of take-home exams

In addition to the written solution, students are asked to record and submit a video explaining (parts of) their solutions. The video does not have to be of high quality, just recorded with a mobile phone and showing the student holding up their solutions and explaining them. When marking, the teacher can fast forward to an arbitrary point in the video and watch 1-2 minutes to check that the student can explain their solutions. If the student cannot, they will fail. If they can explain their solutions, the entire submitted written solution is assessed and graded as usual. However, you should bear in mind that a submitted video can become a public document in the same way as a submitted text or exam.

Appendix 8

Digital examination and cheating

There are several ways to digitalise the examination and we will go through some of the aspects to consider in the different main cases¹⁸. One advantage of digitalised examination is that it can be used to create time flexibility for both the teacher and the student. In general, it can therefore be said that digitalisation of the examination leads to new and thus more opportunities to adapt the examination to the learning objectives and to greater opportunities to meet the students' differences. However, the flexibility inherent in the digitalisation of examinations also invites new forms of cheating, which can be very difficult to control. This means that when choosing a digital examination, a balance needs to be struck between the need to monitor the student and the risk that the result will be corrupted and cannot be used as a basis for grading.

Digital examination in a supervised computer room

The student conducts the examination in a computer room adapted for the purpose, where the computers are configured so that the student only sees his or her own exam and only has access to the digital aids that are permitted during the exam. An invigilator is responsible for checking identity and ensuring that no other aids than those authorised are used during the exam.

Difficulties and opportunities

If the examination is designed to assess knowledge that the student is expected to always have in their own memory, a supervised room examination is a good way to do this digitally. Digitalisation makes it possible to assess the examination digitally, which saves time. However, this type of examination requires the availability of invigilators and suitable computer rooms, which is a question of resources. In addition, if there is a database of randomised questions, it is possible to offer some flexibility in the timing of the examination so that students can be examined at a time that suits them. However, this may lead to a little more administration in terms of booking an exam time.

¹⁸ Andersson, M., Non-proctored home exams - is there a solution? 8th development conference for Sweden's engineering education, 24-25 November 2021.

Bengtsson, L., Take-home exams in higher education: A systematic review, *Education Sciences* 9(4), 267, 2019.

Bearman, M., Dawson, P., Ajjawi, R., Tai, J., Boud, D. (eds) *Re-imagining University Assessment in a Digital World. The Enabling Power of Assessment*, vol 7. Springer, Cham. https://doi.org/10.1007/978-3-030-41956-1_4

Sindre, G., Can cheating on home exams be prevented? *Nordic Journal of STEM Education* 5(1), 3918 (2021), MTN Conference 2021, DOI: <https://doi.org/10.5324/njsteme.v5i1.3918>

Digital examination via quiz

The student completes the examination via one or more quizzes in the course's regular digital course room (or in a special digital exam room). These quizzes are usually short and can be given continuously during the course. The student identifies himself or herself by logging in to the digital system, but otherwise there is no verification of identity. A quiz may contain a question where the student assures that he or she has completed the examination according to the rules that have been set, but normally there is no monitoring of the student or of the aids that students use during the examination.

Difficulties and opportunities

This examination offers a high degree of temporal flexibility, since in most cases a quiz does not require manual supervision and can be set to be completed during a pre-determined time or before a pre-determined deadline. It also invites a high degree of spatial flexibility, as a quiz can be conducted from a place convenient to the student or, if the teacher so wishes, in the context of a lecture or an exercise in the course (the latter requires the student to bring an electronic device to the room). It is also possible to include e.g., videos in the formulation of the task.

Since identification only takes place via login, it is not possible to fully exclude the possibility of students changing identities with each other or collaborating with each other in connection with the examination. Nor can it be excluded that students use undesirable aids in connection with the examination. A pedagogical advantage of quizzes is that they are suitable for automatically testing basic knowledge in a course that is then required to be able to fulfil higher learning objectives in the course. Through quizzes, the examination of basic knowledge can be automated, and the teacher can concentrate on examining the higher learning outcomes required to pass the course. Examination of the higher learning outcomes can also be conditional on the student having passed their quizzes.

Digital examination at home

The student completes the entire examination from home and only submits the solutions to their assignments digitally. The student identifies himself or herself by logging in to the system, but otherwise there is no verification of identity. The student also signs a code of honour where he or she promises to follow the rules that apply, but there is no control of the aids that the student uses.

Difficulties and opportunities

With digital examination at home, there is flexibility in the timing of the examination, ranging from short tasks requiring a few minutes of work to tasks requiring days or even weeks to complete. The student is also not tied to the home but can take the exam at another suitable location. An important aspect to consider in this context is that students have very different home environments and for some students it can be a problem to carry out the examination at home as they feel that they are disturbed by other family members.

This examination has the same problems with cheating as quizzes. Good practice to make cheating more difficult is to vary the students' tasks at least partially. A further measure is to combine the home examination with an oral presentation, either interactively in Zoom or by the student recording a video where they present (parts of) their solutions.

Appendix 9

Generative AI tools and cheating

On 30th November 2022, ChatGPT was launched by the company Open AI. ChatGPT can answer questions, discuss questions, write, and summarise texts, compare texts and terms, develop reasoning, and provide arguments, write, and explain software code and much more. Other similar services like type.ai have since emerged and will be followed by more. There are also AI tools for programmers such as Codex (Github CoPilot), generation of images, videos, sketches, and designs, and much more. In the future, AI tools will become increasingly accessible and embedded in word processors, search services and more. This is a development that universities must accept and manage. One example is Uppsala University, which has developed web pages for teachers on AI and assessment¹⁹.

It is not possible to detect AI-generated texts with standard plagiarism checking tools. There are tools that give a probability that a text is AI-generated, such as GPTZero, but these are easily circumvented. There will be no safe way to detect if a student has used AI generative tools.

The use of generative AI tools in examinations is a form of third-party assistance. Like any other collaboration, it can be allowed or disallowed, depending on what the instructions for the exam say.

How can we limit students' use of generative AI tools in assignment instructions? Saying that no more than a certain percentage of a solution can be developed with generative tools is not clear enough, as the tools can be used in many ways, such as helping with general structure and refining the language. The clearest way is for the instructions to either say that generative AI tools may not be used at all in an assignment or that they are a permitted aid. A reasonable requirement is that students should always indicate in the examination which generative AI tools they have used and how these tools have been used in the solution of the assignment.

There is also a need to consider the legal aspects of using these tools and the risks of using them from a GDPR and security perspective.

We can prevent the unauthorised use of AI tools with the methods mentioned earlier in this document that aim to promote a study culture in the student group that focuses on learning where cheating is not acceptable and to prevent and make cheating more difficult with pedagogical methods, see Appendix 3. There are forms of examination that prevent and discourage cheating with AI tools, in addition to supervised examination.

Oral examination can be used in many ways, see Appendix 7. One use is as a check that the student can explain a previously submitted solution or process. Stepwise examination, where several steps in the solution or development process are captured, makes it more difficult to cheat with AI tools. When formulating homework assignments, it may be a good idea to require references to be given. Asking questions that require answers to be based on or dependent on specific local contexts can also make it more difficult to cheat with AI tools.

¹⁹ See <https://mp.uu.se/en/web/info/undervisa/e-larande/ny-examination-online/om-ai-och-examination>