

## “Can Intelligent Technology really replace American teachers?”

**Public visé :** 1<sup>ère</sup> STI2D

**Notion :** L'idée de progrès.

**Pôle de connaissance :** Systèmes d'information et numérique : l'intelligence artificielle au service de l'homme

**Thème d'étude :** L'enseignement du futur envisagé par les chercheurs américains.

**Problématique :** L'utilisation massive des nouvelles technologies dans l'enseignement est-elle le moyen de mieux faire réussir les élèves et de mieux les former en tant qu'individus ?

La nouvelle d'Isaac Asimov *'The Fun They Had'*, écrite en 1951, nous laisse imaginer une société future (en 2157) dans laquelle les enseignants humains ont disparu pour faire place à des machines censées jouer leurs rôles. Les enfants apprennent chez eux, on ne sait plus ce qu'est un camarade de classe. Les outils destinés à la lecture ressemblent étonnamment à nos écrans d'ordinateurs voire à nos actuelles tablettes numériques.

L'auteur de science-fiction nous apparaît comme un visionnaire, tant à travers cette nouvelle que lors d'une interview datant de 1988. Lors de son entretien avec Bill Moyers, I. Asimov envisage le fait que les ordinateurs pourront devenir des outils à usage individuel permettant à chacun d'apprendre selon son rythme et selon ses propres dispositions. Donc, contrairement à ce qui transparaisait dans sa nouvelle une trentaine d'années plus tôt, la technologie mettrait fin à des pratiques d'enseignement collectif pour gagner en efficacité !

Alors faut-il se laisser convaincre par l'auteur des années cinquante et craindre un enseignement déshumanisé ou celui des années quatre-vingt et se réjouir d'une individualisation croissante des modalités d'enseignement ?

**Tâche finale : Interaction orale sous forme de débat**, pour un groupe de 17 à 22 élèves environ.

Il s'agit d'un jeu de rôle à la taille du groupe d'élèves.

*Imagine you are in 2020. Your high school, located in Atlanta, Georgia, has already allowed a number of its students to visit the Georgia Institute of Technology, especially on its yearly Robotics Week. Simon V, their brand new robot teacher, is now commercialised by Robotics Education Inc. Your School Principal is planning to replace a French teacher with such a robot, however he has accepted to organize a meeting to hear everyone's opinion on this very special issue before making the final decision.*

*The participants will be:*

- *parents' representatives,*
- *teachers (of various subjects),*
- *students,*
- *a representative of the city council,*
- *the salesperson working for R.E Inc.,*
- *a technician in robotics.*

*Can this robot actually replace a human teacher? Speak your mind!*

## Supports utilisés au cours de la séquence :

### Evaluation de la compréhension orale : 'Intelligent Technology' (voir Annexe 1)

Il serait préférable d'effectuer cette évaluation avant le débat final car celle-ci apportera de la matière pour l'interaction. Il est d'ailleurs alors possible d'exploiter le document original en entier (3'23) au moment de la correction pour compléter les arguments qui seront retenus pour ou contre 'robotic teaching'.

### Documents d'entraînement :

- La nouvelle d'Isaac Asimov 'The Fun They Had' (1951) (CE)  
Cette nouvelle exploitée en *reading circle*<sup>1</sup> permet d'introduire sans grande difficulté le thème de la séquence ainsi que le lexique lié à notre problématique. De plus, les échanges suscités par les rôles des *real life connectors* ou des *culture collectors* amorceront déjà des débats que l'on retrouvera abordés dans les divers documents vidéos. Exemple de débats :
  - *Do robots or computers dehumanize teaching?*
  - *How can computers complete your education?*
- Une interview d'Isaac Asimov par Bill Moyers en 1988 (CO):  
[http://www.pbs.org/moyers/journal/blog/2008/03/bill\\_moyers\\_rewind\\_isaac\\_asimo\\_1.html](http://www.pbs.org/moyers/journal/blog/2008/03/bill_moyers_rewind_isaac_asimo_1.html)  
De 9'02 à 15'52, sélectionner les passages où il est question de la motivation des élèves, de l'enseignement de masse à dépasser, des prédispositions de chacun à encourager, de la vision de l'enseignement dans le futur. (voir suggestion d'exploitation ci-dessous)
- Site du Georgia Institute of Technology: *'The Georgia Institute of Technology is one of the nation's top research universities, distinguished by its commitment to improving the human condition through advanced science and technology'*.
  - Notamment aller dans la partie 'research' (CE) :  
<http://www.gatech.edu/research/areas>, pour les sous-dossiers 'people and technology' et 'robotics'.
  - Présentations d'étudiants sur la page des inscriptions (CO) :  
<http://www.admission.gatech.edu/visit>
  - Les vidéos de Georgia Tech (CO):  
<http://www.youtube.com/user/GeorgiaTech?feature=watch>: celles-ci sont assez courtes et relativement simples.

Exemples de documents :

- 2012 Robotics Open House <http://www.youtube.com/watch?v=C9r1mJrWfLs> ('The Georgia Institute of Technology opened its doors to more than 400 middle school and high school students on April 11 for the third annual Robotics Open House.')
- How can robots get our attention? <http://www.youtube.com/watch?v=F1SOoGJGT3I>

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<sup>1</sup> <http://www.anglais.ac-versailles.fr/spip.php?article230>

- Un article du *New York Times*, juillet 2010 (CE) : [Teaching Machine Sticks to Script in South Korea](#). Il permet de rassembler des informations sur un pays dont le gouvernement est impatient de remplacer les assistants américains par de petits robots. Est-ce réaliste et raisonnable ? En outre il aidera les élèves à comprendre le contexte évoqué dans le document d'évaluation de la compréhension orale.

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**Entraînement à la compréhension orale : Bill Moyers, *A World of Ideas*.**

La sélection des passages retenus représente un ensemble d'environ 4 minutes d'écoute. Il est nécessaire de faire un montage vidéo afin de faciliter l'écoute et de ne pas avoir de difficulté à retrouver les moments pertinents. Pour des raisons de droits, nous ne pouvons pas mettre de montage en ligne.

[0'38 -1'36] + [9'01-9'07] + [10'03 -13'04] + [15'23-15'52]

Contrairement à ce que nous faisons parfois en situation d'entraînement, le document ne sera pas donné à écouter en entier une première fois pour une mise en commun éventuelle d'éléments entendus.

Comme il s'agit d'une interview, nous demandons aux élèves **d'imaginer pas à pas** les propos des participants : du journaliste, Bill Moyers, ou de l'écrivain, Isaac Asimov. Cette **anticipation progressive** vise à faciliter la compréhension des questions comme des réponses et entraîne à la préparation d'arguments pour l'interaction finale lors du grand jeu de rôle en classe.

L'entraînement à la compréhension orale de ce document repose essentiellement sur une **démarche d'anticipation** qui prend appui sur ce qui a été fait en amont dans la séquence, par exemple lors de la lecture de la nouvelle d'Asimov.

**Mise en condition avant l'écoute de l'interview :** Afin de nous assurer que les élèves auront bien tous en mémoire le message délivré par la nouvelle, nous proposons un travail préalable en équipe de 3 ou 4 élèves sur des résumés que nous aurons constitués nous-mêmes en prenant soin de n'être pas totalement fidèles à l'histoire. Il leur revient de les corriger et de les compléter.

**Tâche :** *You run a collaborative blog (www.lit-easy4U.com) to help students do their literature homework. You start the topic 'Asimov : robots vs teachers ?' You have received two summaries of the short story 'The Fun They had', however contributors are not always completely reliable ! Proofread their summaries before uploading the best one. (voir Annexe 4)*

Les élèves écoutent ensuite l'entretien afin de pouvoir réaliser **la tâche** de production orale en **interaction** suivante:

*As one of Asimov's teenage fans, you are going to be the guest at a weekly radio broadcast entitled 'Robotics'. This special programme focusses on: 'Robotic teaching : should Asimov's science fiction really turn into science facts?'*

*You are going to be interviewed for 2 or 3 minutes on Asimov's conception of school and robotic teaching as well as on your own opinion on that topic.*

**Mise en œuvre :**

**To prepare that interview, you watch a programme dating from 1988.** This is the early age of the commercialization of internet service through providers.

37 years after writing 'The Fun They Had', Isaac Asimov was interviewed by famous news commentator Bill Moyers in his programme entitled *Bill Moyers's Journal*. **Let's listen to the second chapter of the interview.**

### Let's guess what it might be about:

[0'38 - 0'49]. Bill Moyers introduces the topic of the interview with the following words: 'As my guest tonight **warns**, if we are going to keep turning **science fiction** into **science facts**, we may have to **rethink what we mean by education**, and he should know.'

Faire repérer les mots clés les plus simples aux élèves puis reconstruire l'énoncé peu à peu à l'aide des verbes reconnus et des auxiliaires modaux.

### What does he mean? (faire expliciter les expressions suivantes) :

'keep turning science **fiction** into science **facts**': that is to say what used to be science fiction can be real now. For example, as we saw in the story, Margie reads on screens that could be likened to our tablets or ebooks. Besides her teacher is a kind of machine in which she feeds her homework and we now have access to all sorts of software to test our skills on computers.

'we may have to **rethink** what we mean by **education**': we may have to change our ways of teaching, we may need to educate children in a different way.

'as my guest tonight **warns**': this sounds like a threat ; he implies that if we are not cautious, something detrimental may happen.

So we can anticipate that Bill Moyers is going to interview Asimov on **the topic of education, its evolution.**

[1'14 – 1'31] présentation de l'écrivain de science-fiction, liste de mots faciles à repérer :

**On what subjects has he written?** Faire reconnaître les noms des domaines, qui sont assez simples à discriminer. Petit entraînement de mémoire à court terme : **Try to recognize and remember at least 4 subjects.** Effectuer un travail sur l'accentuation des noms :

**'Science fiction / Science facts / Chemistry / Astronomy / Physics / Biology / Children's books / History / Maths'.**

**When you see that long list, what can you imagine about Asimov's personality, experience, or skills?**

- He must be really bright.
- He is curious.
- He must have studied for years to be able to write all that.
- He must be a man of genius.
- How can you write both on science and history?
- He obviously has a wide knowledge of a variety of subjects. Etc.

**Imagine you travel in a time machine to meet your favourite author back in 1988, what questions would you like to ask him, then?**

- How did you manage to write on so many different topics?
- Why did you write children's books?
- Why did you write science fiction and about science facts as well?
- How did you learn about all that?
- Were you a good student in high school? Were you proficient both in science and humanities?
- Did you enjoy going to school?
- Do you have several university degrees?
- Are you a scientist or a book writer? Etc.

Conclusion: **Listen. How was Asimov described by a scientist?**

[1'32 - 1'36] Bill Moyers : 'one scientist called Asimov the greatest **explainer** of the age.'

Could you think of synonyms for 'explainer' as it is not commonly used? 'teacher', 'educator', 'pedagogue' (à donner aux élèves car apparaît ensuite).

Why not say 'teacher', then, in his case? He isn't an actual teacher, he is rather someone who helps us understand science facts.

Puis passer au moment de l'entretien en lien direct avec la problématique de notre séquence. [9'01-9'07]

Repeat Bill Moyers's first question:

'Can we have a **revolution** in **learning**?'

How can Asimov answer ? Inciter les élèves à aller au-delà de la réponse brève et à justifier un peu.

-Yes, we can because students want to learn in different ways. Some students may be fed up with school.

-No, we can't because the system is well established / because the government will never change the education system / because going to school to learn keeps kids busy.

Listen to his answer.

'Yes, I think not only we **can** but we're going to **have to**'.

[10'03 – 10'19] Find out who or what justifies such a revolution :

Imagine you are a student answering a survey entitled 'All together for a better school': list three reasons why school education 1/ is successful 2/ has to change.

- Some teachers have a special knack for sparking your interest.
- We are obliged to learn a number of subjects while we do not necessarily have a natural bent for them, which forces us to open our minds.
- We can participate to clubs after classes, thus we can socialize.

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- What we learn is boring, too remote from our dispositions. We don't feel concerned.
- We are overloaded with homework.
- We enjoy group work, so we should do projects in groups more often.
- There are too many of us in class.

Compare your views with Asimov's. He weighs the pros and cons of school education in the past and then in the present. Classify his arguments into the following categories: what is or was profitable; what is or was detrimental.

Pros		Cons	
Past	Present	Past	Present

(Ignorer les éléments indiqués entre parenthèses pour cette activité)

In the old days, very few people could read and write. (Literacy was a very novel sort of thing, and it was felt that most people just didn't have it in them). But with mass education, it turned out that most people could be taught to read and write.

[11'04-11'28] **Nowadays** what people call learning is forced on you. And everyone is forced to learn the same thing on the same day at the same speed in class. And everyone is different. For some, it goes too fast, for some too slow, for some in the wrong direction. *(But give them a chance, in addition to school, I don't say we abolish school, to follow up their own bent from the start.)*

**So, how can you teach students at their own speed?**

- By teaching them in smaller groups
- By using computers, etc.

**BM is here to raise the debate, what contradiction can he bring to such propositions? Listen.**

- Teaching in smaller groups would imply more teachers, so it would be too expensive
- In 1988 computers were much too expensive to provide every school with enough machines. Etc.

**Listen to BM's reaction first and then anticipate Asimov's justification.**

BM: 'Well, I love the vision of it but what about the argument that machines, like computers, **dehumanize** learning?'

**After reading 'The Fun They Had', in your opinion, what will Asimov answer?**

- Indeed, replacing teachers by machines such as computers or robots is not the solution. Etc.

**Listen and check.**

Asimov: '**Well, as a matter of fact, it's just the reverse.** It seems to me, it's through this machine that for the first time, we'll be able to have a **one-to-one relationship** between **information source** and **information consumer.**'

BM: 'What do you mean?'

**Say in your own words what Asimov may mean.**

- With machines such as computers the consumer, ie the student, can have a private teacher, ie the computer.

Asimov: 'Well, in the old days, you used to have tutors for children. A person who could afford it would hire a pedagogue or a tutor and he would teach the children. If he knew his job, he could adapt his teaching to the tastes and abilities of the students, you see. *(But how many people could afford to hire a pedagogue? Most children went uneducated.)* Then we reached the point where it was absolutely necessary to educate everybody. But the only way we could do it was to have one teacher for a great many students (*, and in order to organize the situation properly we gave the teacher a curriculum to teach from.*)'[12'33]

[12'43] 'So we either have a one-to-one relationship for the very few or one-to-the many relationship for the many. Now there's a possibility for a one-to-one relationship for the many. Everyone can have a teacher in the form of an access to the gathered knowledge of the human species.'

**Where is that 'gathered knowledge'? How can it be made available through computers?**

- It can be provided through websites or blogs.
- It can consist of encyclopaedias such as Wikipedia nowadays.
- You can find reference knowledge on official websites such as the one of the Library of Congress, etc.

**Check the explanation given in 1988, when the commercialization of internet service was beginning.**

[13'04-13'10]

BM: 'Through the libraries that are connected to the computer on my desk in my home?'

Asimov: 'That's right.'

[15'23-15'28]

BM: 'So, in a sense, every student has his or her own private school?'

**From what you have heard so far on Asimov's part and your reading of the short story, can you guess whether he is now completely at odds with what he seemed to say back in the 1950s about the dehumanization of school ? Will he end this talk promoting the end of schools or not?**

- He seems to really promote the use of computers to improve education.
- Earlier on he said he did not advocate the abolition of school, however he is critical of the fact that children can't learn at their own speed.
- Maybe he will contend that computers will become necessary and human educators will no longer be the only teachers.

**Listen:**

[15'29-15'52] Asimov: 'Yes, and it belongs to him or her. He can be the sole dictator of what he is going to learn, of what he is going to study. Mind you, this is not all thing he is going to do, he'll still be going to school for some things that he has to know.'

BM: 'Common knowledge, common data base.'

Asimov: 'Well, the interaction with the other students and the teachers, you can't get away from that.' [15'52]

**So, what cannot be replaced by computer teaching?**

- Interaction with human beings: ie mutual help, sharing, common culture, etc.

**Cette étape a permis**

- de dégager des arguments que les élèves auront à mobiliser lors de la tâche d'interaction orale,
- d'aider chacun à renforcer ses stratégies d'écoute afin d'être plus performant dans les situations d'échange.